



Fossil fuel free zones

Action on climate needs policies to reduce fossil fuel supply, transport and use. Support for such policies could be developed through fossil fuel free zones, which could be as small as a household, or as large as groups of countries. A precedent exists in the global spread of nuclear weapons free zones.

Discussion paper

Fergus Green

December 2018

ABOUT THE AUSTRALIA INSTITUTE

The Australia Institute is an independent public policy think tank based in Canberra. It is funded by donations from philanthropic trusts and individuals and commissioned research. We barrack for ideas, not political parties or candidates. Since its launch in 1994, the Institute has carried out highly influential research on a broad range of economic, social and environmental issues.

OUR PHILOSOPHY

As we begin the 21st century, new dilemmas confront our society and our planet. Unprecedented levels of consumption co-exist with extreme poverty. Through new technology we are more connected than we have ever been, yet civic engagement is declining. Environmental neglect continues despite heightened ecological awareness. A better balance is urgently needed.

The Australia Institute's directors, staff and supporters represent a broad range of views and priorities. What unites us is a belief that through a combination of research and creativity we can promote new solutions and ways of thinking.

OUR PURPOSE - 'RESEARCH THAT MATTERS'

The Institute publishes research that contributes to a more just, sustainable and peaceful society. Our goal is to gather, interpret and communicate evidence in order to both diagnose the problems we face and propose new solutions to tackle them.

The Institute is wholly independent and not affiliated with any other organisation. Donations to its Research Fund are tax deductible for the donor. Anyone wishing to donate can do so via the website at <https://www.tai.org.au> or by calling the Institute on 02 6130 0530. Our secure and user-friendly website allows donors to make either one-off or regular monthly donations and we encourage everyone who can to donate in this way as it assists our research in the most significant manner.

Level 1, Endeavour House, 1 Franklin St

Canberra, ACT 2601

Tel: (02) 61300530

Email: mail@tai.org.au

Website: www.tai.org.au

ISSN: 1836-9014

About the Author

Fergus Green is a researcher at the London School of Economics & Political Science (LSE) and a climate policy consultant. From January 2014 to October 2015 Fergus was a Policy Analyst and Research Advisor to Professor Nicholas Stern at the LSE's Grantham Research Institute on Climate Change and the Environment and the Centre for Climate Change Economics and Policy, where his work focused on international climate cooperation, China, and various theoretical topics relating to climate change mitigation. He was also a Teaching Fellow in the Centre for International Studies & Diplomacy at SOAS (2013–14), teaching Global Energy & Climate Policy at masters level. Before moving to London Fergus practiced as a lawyer in the Melbourne office of a large corporate firm for three and a half years, specialising in climate change, energy, water and environmental regulation. Fergus is currently undertaking a PhD in Political Science in the LSE's Department of Government, focusing on the political ethics of legal transitions. He is also an Associate of the Melbourne Sustainable Society Institute at his alma mater, the University of Melbourne, and a researcher on the international Coal Transitions Project, attached to the Australian National University. His academic work has been published in the journals Nature Climate Change, Climatic Change, Climate Policy, and Moral Philosophy & Politics.

Summary

A Fossil Fuel Free Zone (FFFZ) is a geographic area characterised by the complete absence of fossil fuel exploration, production, transportation, intermediate treatment, and consumption activities. Many “intermediate” zonal statuses are also defined, e.g. “coal supply free zone” (see Figure 1).

Figure 1: Fossil Fuel Free Zones - activities and fuels prohibited by intermediate zones

	Coal	Gas	Oil	All Fossil Fuels
Exploration	Coal Supply Free Zone	Gas Supply Free Zone	Oil Supply Free Zone	Fossil Fuel Supply Free Zone
Production/mining/extraction				
Transport, intermediate treatment & distribution	(e.g. “Coal Port Free Coastline”)	(e.g. “Pipeline Free Province”)	(e.g. “Pipeline Free Province”)	
Consumption	Coal Use Free Zone	Gas Use Free Zone	Oil Use Free Zone	Fossil Fuel Use Free Zone
All of the above activities	Coal Free Zone	Gas Free Zone	Oil Free Zone	Fossil Fuel Free Zone

Any collective entity at any scale—a local football club, university, municipality/council, subnational state/province, country, regional grouping of countries, or the entire world—could in principle be a FFFZ. All it would take is for people to declare what they already are (e.g. the vast majority of the world is already a “fossil fuel supply free zone”) and start working toward ‘higher’ status.

Public declarations of achievement by collectives would inspire followers elsewhere, help build global norms against fossil fuels, and shame laggards. Participation in meaningful collective action also gives people a sense of personal efficacy in contributing to climate mitigation that isolated individual actions do not. Groups at similar levels (eg. municipality-to-municipality) could build networks and exchange

ideas and information about how to progress to higher levels. Crucially, this initiative would be additive and complementary to (not competitive with) existing initiatives such as C40 cities, ICLEI, transition towns, coal moratoria, fracking bans etc.

This proposal draws on a wide body of social science theory and evidence—concerning, e.g., the development and spread of moral and social norms, behavioural psychology, social movements and political mobilisation—analysed and discussed by the author in associated academic journal articles. It also draws on the historical precedent of Nuclear Weapon Free Zones, five of which have been established by international treaty in populated regions of the world—Latin America, the South Pacific, Southeast Asia, Africa, and Central Asia—and which have been highly effective nuclear non-proliferation and disarmament institutions.

An organisational platform is needed to further develop the strategy, and to champion and lead this effort. This body could also: further define each zonal status and the criteria necessary to achieve it; develop an authoritative system of reporting and verification to certify the achievement of zonal statuses by participants; facilitate network-building and information exchange among participants; and maintain a public website with a central, easily searchable database of zones around the world.

1 Introduction

“You can’t climb a ladder by starting at the top”

- David Lange, Chair of the South Pacific Forum, upon the signing of the South Pacific Nuclear Free Zone Treaty in Rarotonga, Cook Islands, 6 August 1985 (quoted in Hamel-Green 1998, 59)

“Testing nuclear weapons, owning slaves and waging aggressive war were all once normal practices—in some cases, for much of human history. Today, robust global moral norms socially condition states and their citizens to see these practices as morally wrong, and to regulate them accordingly. What prospect is there for the exploitation of fossil fuels to meet the same fate?”

Motivated by the imperative to phase out fossil fuels within a timeframe consistent with the Paris Agreement and, more generally, with a high chance of restraining climate change to within manageable limits, this is the opening question I pose in my recently published article entitled “Anti-Fossil Fuel Norms” (Green 2018a). In that article, I explain how moral norms prohibiting various types of fossil fuel production, consumption and investment activities are being originated, and how they are likely to spread and affect the behaviour of states. There is, I concluded, strong potential for the promotion of such norms to have a material positive influence on the politics of climate change action, essentially making legal regulation of fossil fuels more politically feasible, at both domestic and international level. I have subsequently argued that *bans* on fossil fuel related activities (Green 2018b) and policies to constrain fossil fuel *supply* (Green and Denniss 2018) have particularly strong potential to inculcate anti-fossil fuel norms.

Building on the theoretical case established in that body of research, the present paper proposes the development of a new system of anti-fossil fuel norms, which I call *Fossil Fuel Free Zones* (FFFZs). A FFFZ is here defined as a geographic area characterised by the complete absence of fossil fuel exploration, production, transportation, intermediate treatment, and consumption activities. Many “intermediate” zonal statuses are also defined, e.g. “coal supply free zone”. Collectively, the proposed system of FFFZs can be conceived as a multi-level or “polycentric” system of energy-climate governance¹ (Jordan et al. 2015; Ostrom 1990, 2014) — one that harnesses the

¹ I define climate governance as authoritative social steering toward a collective climate change goal (c.f. Andonova, Betsill, and Bulkeley 2009). This definition is wide enough to recognize that both state and

power of networks to provide “authoritative social steering” (Andonova, Betsill, and Bulkeley 2009) to the widest possible range of groups, from small, local associations to the United Nations.

Part 2 introduces the precedent case of Nuclear Weapon Free Zones, the success of which over many decades yields both theoretical insights into and lends practical plausibility to the proposal for FFFZs. Part 3 explains the content of the FFFZs proposal in more detail and considers how it could be operationalised. It also discusses the normative and political “logic” on which the proposal is predicated—essentially, the theoretical grounds on which we have reason to expect that this proposal can “make a difference” to the global climate change mitigation effort. Part 4 concludes with some suggested next steps to implement the proposal and for related research.

non-state actors can be engaged in climate governance tasks, and includes authoritative forms of norm promotion (Gunningham 2017, 316).

2 The precedent: Nuclear Weapon Free Zones

The idea of establishing a nuclear weapons free zone (NWFZ) was articulated as early as 1958 by the Polish government, which feared the nuclearisation of West Germany and wanted to prevent the deployment of Soviet nuclear weapons on its territory (Goldblat 1997, 18). While this particular NWFZ never materialised, several of its elements were later adopted as guidelines for the establishment of other NWFZs and the idea began to be championed by nuclear arms control advocates in various parts of the world (Goldblat 1997, 18; Thakur 1998a). Since that time, five NWFZs have been established in populated regions of the world—Latin America (1967), the South Pacific (1985), Southeast Asia (1995), Africa (1996), and Central Asia (2006)—and four additional treaties prohibit the nuclearisation of, respectively, the Antarctic continent, the seabed, outer space and the moon.²

The existing system of NWFZs “is a regional approach to strengthen global nuclear non-proliferation and disarmament norms and consolidate international efforts towards peace and security”.³ More specifically, a NWFZ is a treaty-based arrangement in which a group of states establishes (i) a defined geographic area characterised by the absence of nuclear weapons and (ii) a system of verification and control to guarantee compliance.⁴ A NWFZ prohibits, within the defined zone, at least the *possession, testing, deployment and use* of nuclear weapons (Thakur 1998b, 6–7).

NWFZs provide a useful, analogous model for my proposal for the development of a system of FFFZs. First, NWFZs constitute a family of international moral norms whose emergence and trajectory followed the norm “life-cycle” model (Finnemore and Sikkink 1998) that is common to many international moral norms (e.g. human rights; landmine ban; decolonisation; enfranchisement of women). NWFZs began with a concerted process of *norm entrepreneurship* (Sunstein 1996). NGOs and citizen anti-nuclear advocates—as well as some enthusiastic political parties and governments of the relevant regions—were able to build sufficient support among key regional states. The norm then became *institutionalised* within international treaties and organisations. Institutionalisation was aided by important reports under UN auspices

² The formal details of all treaties can be found at UNODA, “Nuclear-Weapon-Free Zones”, <https://www.un.org/disarmament/wmd/nuclear/nwzf/>.

³ Ibid.

⁴ United Nations General Assembly Resolution 3472 B (1975).

(in 1975 and 1985) and by the negotiation and implementation of the NWFZ treaties themselves, which codified the norms into detailed, specific rules and established verification and enforcement regimes of varying stringency. The NWFZs have proved durable, and the underlying norms have become *internalised* within the bureaucratic apparatuses and cultures of the parties to the relevant treaties (a.k.a “zonal states”).

Second, NWFZs are effective. Scholars of the NWFZ process have argued that particular NWFZs have had numerous important effects (see the chapters in Thakur 1998a): (1) successfully prevented nuclear proliferation within zonal states; (2) socialised zonal states who initially harboured nuclear ambitions, or remained ambiguous about their ambitions, to adopt an anti-nuclear position (e.g. Brazil and Argentina); (3) established precedents, ideas and evidence that increased the likelihood of other regions establishing NWFZs; (4) strengthened *global* norms against nuclear weapons proliferation, testing, deployment and use; and (5) helped to build confidence internationally in nuclear *disarmament* efforts, thereby also strengthening a global nuclear disarmament norm and more generally further delegitimising nuclear weapons *per se*.

Points (1) and (2) speak to the effect of NWFZs within the zones and zonal states themselves, including the positive feedback effect⁵ that NWFZs have had among their membership. Points (3)–(5) highlight the positive feedback effects that NWFZs generated outside of their respective zones. Points (3) and (4) show how a norm established in one region can inspire its replication and evolution in a different region (an example of “norm/policy diffusion”) and can contribute to the building of *global* norms, notwithstanding the limited geographic location of the NWFZs. Point (5) illustrates how NWFZs helped to strengthen not only the particular norms that they embodied (e.g. against nuclear weapons possession, testing, deployment and use) but also strengthened a system of more general anti-nuclear weapons, arms control, peace and security norms in which they were nested. As Thakur explains, the nuclear arms control agenda “has two interlinked components: non-proliferation and disarmament. [NWFZs] are legal mechanisms for the former and political stepping stones towards the latter” (Thakur 1998b, 3). This point illustrates the way that international norms exist in a structure of related norms operating at the same level or different levels (Bernstein 2000, 483).

Third, NWFZs illustrate how small groups of relatively non-powerful actors (both states and non-state actors) could make a tangible contribution to a seemingly intractable

⁵ For an explanation of feedback effects and their application to the study of policies and norms, see Green (2018a, 106–07)

problem (global nuclear disarmament),⁶ over which they had little direct control, through strategic norm-building efforts that amplified their influence over time through positive feedback effects. While the nuclear debate was dominated by the nuclear powers, other countries were nonetheless able to have considerable influence over the course of global affairs through the strategic building of norms. Small states influenced middle powers; middle powers influenced bigger powers, and so on.

⁶ For example, the Treaty of Rarotonga, establishing the South Pacific NWFZ, was finalised in the midst of the cold war in 1985. At that time, it is estimated that more than 60,000 nuclear warheads were deployed worldwide.

3 Fossil fuel free zones and intermediate zones: a proposed system of nested norms

FFFZS: THE BASIC IDEA

The proposal of this paper, aimed at climate change and anti-fossil fuel norm entrepreneurs, is to develop a system of geographic zones characterised by the absence of particular actions related to particular fossil fuels, working toward the ultimate status of a “Fossil Fuel Free Zone”.

The incremental steps toward that ultimate status would include zones prohibiting and declaring the absence of (i) exploration for; (ii) production/mining/extraction of; (iii) transport, intermediate treatment (e.g. oil refining) and distribution of; and (iv) consumption of (a) coal, (b) gas and (c) oil (with respect to the first three activities, oil and gas could be further divided into unconventional or conventional sources; coal could further be divided into thermal and coking coal). For example, a “coal supply free zone” would prohibit, and guarantee the absence of, coal exploration and mining/production activities, but not necessarily its transportation, intermediate production and consumption, whereas a “coal free zone” would prohibit all such activities. Figure 1 illustrates the key intermediate zonal categories that could be established, in descending order based on the supply chain, culminating in a Fossil Fuel Free Zone in the bottom right hand cell.

Figure 2: Fossil Fuel Free Zones - activities and fuels prohibited by intermediate zones

	Coal	Gas	Oil	All Fossil Fuels
Exploration	Coal Supply Free Zone	Gas Supply Free Zone	Oil Supply Free Zone	Fossil Fuel Supply Free Zone
Production/mining/extraction				
Transport, intermediate treatment & distribution	(e.g. “Coal Port Free Coastline”)	(e.g. “Pipeline Free Province”)	(e.g. “Pipeline Free Province”)	
Consumption	Coal Use Free Zone	Gas Use Free Zone	Oil Use Free Zone	Fossil Fuel Use Free Zone
All of the above activities	Coal Free Zone	Gas Free Zone	Oil Free Zone	Fossil Fuel Free Zone

OPERATIONALISING FFFZS

An attractive feature of this idea is that participation is possible at multiple scales—in fact, at *any* scale, from the global to the hyper-local—and can be undertaken by non-state actors and sub-national entities, as well as states. All it would take is groups working to achieve different levels of fossil fuel freedom and publicly declaring their status at each level. For example, one could readily envisage a number of communities (e.g. via their local municipal authority/council) and provincial governments attaining coal free status relatively quickly. But one could equally envisage “fossil fuel free households”, “fossil fuel free companies”, “fossil fuel free football clubs”, and “fossil fuel free universities” becoming marks of social status in a decarbonising world.

To facilitate this process, a sponsoring non-government organisation (NGO) is needed to “own”, champion, lead and standardise the initiative, perhaps in partnership with a suitable “first adopter” at each jurisdictional level, focusing in particular on non-state actors and subnational governments where early adoption is most likely to be forthcoming. This organisation could be responsible for the following activities:

- drafting guidelines specifying the essential criteria to be met in order to achieve each zonal status, with suitable differentiation for different kinds of entities (to facilitate adoption and consistent application of the norm);
- facilitating the emergence of national and transnational networks through which to diffuse among entities at similar scales information and ideas about actions to help achieve each zonal status (similar to ICLEI, C40 cities, networks of community energy groups, and the network of “transition towns” in various parts of the world);
- maintaining a public website with a central, easily searchable database of zones around the world, and visualisations thereof;⁷ and
- creating monitoring reporting, verification and certification systems to further standardise the process of zonal status attainment and compliance.

Regarding the last point, precedents for similar privately-provided governance systems in the climate context include the Carbon Disclosure Project, various carbon offset standards, and the Green Bonds Initiative’s certification service, among others.

Monitoring, reporting and verification (MRV) would be much easier for fossil fuel supply and transportation-related activities than it would be for consumption-related activities due to the smaller number of suppliers than consumers and the more readily observable nature of fossil fuel production and supply activities (Collier and Venables 2015; Green and Denniss 2018, 83–84; Kerr and Duscha 2014). While monitoring consumption (especially via electricity use) is more challenging, systems already exist for the MRV of greenhouse gas emissions from fossil fuel consumption, and these can be built upon for the purpose of attaining and certifying “Fossil Fuel Use Free Zones”.⁸

At the national and international levels, the NGO administering the FFFZs system could work with progressive government actors and existing international organisations to establish national, regional and multilateral zones and associated MRV regimes that utilise formal political or legal processes. This would develop and institutionalise the norm internationally, as occurred with NWFZs. This process should begin with the most feasible and urgent activities (e.g. coal supply and coal-fired power stations) in

⁷ A good precedent is Food & Water Watch’s regularly-updated database of local jurisdictions’ resolutions against hydraulic fracturing for natural gas:
<http://www.foodandwaterwatch.org/insight/local-resolutions-against-fracking>.

⁸ Indeed, many governments and private organisations have experience with voluntary certification bodies focused on greenhouse gas emissions and “carbon offsets”, which utilise various techniques to measure, report on and verify emissions and emissions reductions.

countries and regions that are most active on climate change mitigation, with the aim of inspiring emulation in other countries and ascension to zonal statuses requiring more challenging actions (see Green 2018a, 111–12).

THE LOGIC OF FFFZS

Why are FFFZs likely to make a difference to the difficult global politics of climate action? The “logic” of fossil fuel bans is discussed below, drawing on the power of framing, social mobilisation, networks, the combination of “top-down” and “bottom-up” pressure, and of course, moral and social norms. The features of the system of FFFZs discussed here increase the likelihood of anti-fossil fuel norms being adopted sufficiently widely to trigger “tipping” and “cascade” dynamics whereby many actors adopt a norm in rapid succession (Finnemore and Sikkink 1998; Heal and Kunreuther 2012; Sunstein 1996).

First, the proposed system of FFFZs involves a “frame” that is likely to be highly resonant with ordinary people, and therefore helpful in mobilising non-state and subnational actors to develop local-level FFFZs.⁹ The fact that each zonal status is characterised by the *total absence* of a particular fossil fuel-related activity or of a particular fossil fuel makes the notion extremely simple to grasp. “Ban coal (mining/use etc.)” is a straightforward deontological injunction focused on a readily understood commodity (or activity); as such, it is much easier to understand than, say, “reduce greenhouse gas emissions by 27% below 2005 levels by 2030 as part of a fair share contribution to our common but differentiated responsibility to keeping global warming below 2°C with a 50% probability” (Green 2018a, 108). From a political mobilisation perspective, this difference is crucial: simply put, the former is a lot more likely to resonate with the target audience when emblazoned on a placard. Bans, moreover, signal to a wider audience the wrongness of the banned activity, which strengthens the underlying moral norm proscribing it (Green 2018b, 450).

An additional framing benefit derives from the focus on fossil fuels itself. Fossil fuels have a range of negative impacts (i.e. *in addition* to climate change) at multiple scales, including local impacts such as air, soil and water pollution, and associated adverse public health impacts. Norms prohibiting fossil fuel-related activities are therefore more likely than climate change *per se* to appeal to the everyday concerns and priorities of a wide range of people (Green 2018a, 108). These negative impacts are reinforced by invocation of “freedom” from fossil fuels: FFFZs frame fossil fuels as a source of oppression from which liberation is desirable. Frames that draw on widely

⁹ For a summary of insights from relevant literature on framing, see Green (2018a, pt. 3.1.1).

appealing liberal values such as freedom, moreover, tend to be more resonant (Corner, Markowitz, and Pidgeon 2014; Leiserowitz, Kates, and Parris 2006).

Second, by explicitly encouraging non-state and sub-national groups to work toward freedom from fossil fuels at local scales and through existing community, civic, and business-based networks, the system of FFFZs I propose would facilitate the kind of *group-based climate change action* that has been found to be effective in motivating pro-environmental behaviour change with positive spillover effects (see Climate Change Communication Advisory Group 2010, 8–9; Corner, Markowitz, and Pidgeon 2014, 417 and evidence there cited; and see Grady-Benson and Sarathy 2015 on student-led divestment initiatives). In this way, FFFZs would also facilitate alliance building and network formation, which are also crucial to effective political mobilisation (Bomberg 2012).

Third, by facilitating group action at group-relevant scales and creating a system of progressively more difficult achievements, FFFZs facilitate the “small wins” that reinforce hope and the shared sense of collective efficacy that sustains participation in collective action over time (Alinsky 1989; McAdam 2017, 205; Weick 1984).

Fourth, the fact that this proposed system of FFFZs effectively embeds more feasible norms within a larger system of harder-to-achieve norms facilitates positive feedback effects between norms at different levels of generality. Just as NWFZs both further non-proliferation objectives directly and further disarmament objectives indirectly, an anti-coal supply norm, for example, is likely to further an anti-coal norm and an anti-fossil fuel norm.

Fifth, the proposed system facilitates the spread of anti-fossil fuel norms and policies to other jurisdictions at the same or different levels, thus helping to overcome collective action problems that otherwise frustrate the politics of climate change mitigation (Ostrom 2014). Actions to ban or phase-out fossil fuel activities in one jurisdiction (or non-state entity) can increase the likelihood that other jurisdictions (or other non-state entities) at the same level will take similar actions even in the absence of direct persuasion or coercion (Green 2018a, 2018b)—call this a *horizontal positive feedback effect*. Anti-fossil fuel norms and policies such as bans can spread to others via various possible mechanisms, including: providing inspiration, ideas, functional information, and evidence from which norm-entrepreneurs and policymakers in other jurisdictions/entities learn and emulate (Hopke 2016); and redefining what counts as morally appropriate behaviour for other jurisdictions/entities, which can induce the latter to reciprocate out of a sense of appropriateness or the social incentives of peer esteem and status (Green 2018a, 110–12, 2018b, 450). We have seen precisely these various mechanisms at work among a group of countries at the international level

already in relation to coal-fired power station phase-outs under the auspices of the Powering Past Coal Alliance (Green 2018a, 112). As a moral norm against a particular activity is strengthened, moral pressure becomes concentrated on similarly-situated agents elsewhere who are lagging behind or free-riding (Collier and Venables 2015, 503–4; Green 2018a, 112–13; Jacquet 2015, 71–75).

We also know that while many *states* are reluctant to take the necessary action to phase out fossil fuels within their jurisdiction, such action tends to be politically more feasible and forthcoming at smaller scales such as cities, universities and companies (Chan et al. 2015). One important advantage of the proposed system of FFFZs is its “polycentricity” (Jordan et al. 2015; Ostrom 1990, 2014)—its applicability to multiple scales and types of actors, including small-scale actors.¹⁰ This feature enables the scheme to leverage the existing stock of political capital for climate action at lower scales in order to pressure states “from below” (Brysk 1993) to eliminate fossil fuels. As more and more non-state and sub-national entities within a country (for example) achieve and publicly declare a given fossil fuel zonal status, the more politically feasible and likely it becomes that that country will itself be able to declare that status, or will institute policies to phase-out any remaining fossil fuel activities as required to achieve that status within the national jurisdiction. Call this a *vertical positive feedback effect*.

These horizontal and vertical positive feedback effects can interact and mutually reinforce one another (Green 2018a, 2018b). These kinds of effects are also central to the political logic of the Paris Agreement (Falkner 2016; Hale 2016). As such, the present proposal is highly complementary to the Paris Agreement, and is in fact one means of operationalising its largely inchoate aspirations (see also the Electronic Supplementary Material in Green 2018a; Green and Denniss 2018, 83). Indeed, commitments to achieve FFFZs could usefully be incorporated within countries’ Nationally Determined Contributions to the Paris Agreement in much the same way as policies targeting fossil fuel supply could be included (Piggot et al. 2018).

MITIGATING NEGATIVE FEEDBACK EFFECTS

While I have pointed to the positive *social*, *political* and *normative* feedback mechanisms that the proposed system of FFFZs would trigger, any economist will point out that some *economic* feedback effects of increasing bans on fossil fuels will, as with

¹⁰ This is an important difference between fossil fuels, which are used widely throughout the world at multiple scales, and nuclear weapons, whose technological sophistication and cost makes them effectively available only to states. The system of FFFZs can therefore exploit polycentricity in a way that NWFZs could not.

all climate policies, cut the other way (i.e. there are some “negative” feedback effects in the economic domain). In traded markets for energy, climate actions by one region/country to reduce the use of, say, oil will, all other things being equal, reduce demand for and hence lower the price of oil in an international market, in turn increasing the quantity of oil demanded elsewhere (a phenomenon known as “leakage”) (Collier and Venables 2015).¹¹ Additionally, actions that increase the credibility of the signal that coal consumption will be eliminated or substantially reduced in the future may have the perverse effect of inducing suppliers of coal in the present to expand their supply more rapidly than they otherwise would (while there is still a market for it) in turn further lowering the price and incentivising an increase in coal consumption (the so-called “green paradox”) (Sinn 2008, 2012; but see Edenhofer and Kalkuhl 2011; van der Ploeg and Withagen 2012). Moreover, since fossil fuels are partial substitutes in some applications, actions to reduce coal may perversely increase the consumption of gas (similarly with gas and oil).¹²

These considerations imply the need for *both* demand and supply-side measures. Since climate policy advocates have traditionally focused more on measures to cut the demand for fossil fuels (such as carbon pricing and renewable energy subsidies), a greater focus on supply-side climate policies—such as moratoriums, production quotas, production taxes and the removal of production subsidies—is warranted (Green and Denniss 2018; Lazarus and van Asselt 2018). This strategy of “cutting with both arms of the scissors” helps mitigate the negative economic feedback effects mentioned above (Green and Denniss 2018).¹³ This is one reason why the system of FFFZs proposed here includes zones that prohibit fossil fuel *supply* activities as well as zones focused on the consumption (demand side) of fossil fuels.

Norm entrepreneurs and supportive policymakers will need to think through the sequencing and combination of policies to best achieve fossil fuel freedom in the desired timeframe—minimising the negative economic feedback effects of the incremental steps whilst maximising their positive social, political and normative feedback effects (Collier and Venables 2015).

¹¹ Note that these market-driven effects apply, to a greater or lesser extent depending on elasticities, to *all* actions to mitigate climate change that affect the demand for and supply of fossil fuels that are internationally traded, including carbon pricing schemes and other policies that have been traditionally favoured by experts.

¹² A very limited amount of fuel switching from coal to gas may be desirable under certain stringent conditions and for a very limited time frame.

¹³ Additional measures may be needed to mitigate undesirable fossil fuel switching.

4 Conclusion

The ladder to a fossil fuel free world is long—so long that many of the upper rungs are not even visible. This paper has argued that FFFZs can help us to scale those rungs more quickly by acting as a focal point for popular and elite political mobilisation and through the horizontal and vertical diffusion of anti-fossil fuel norms and policies.

In terms of concrete next steps, the proposal needs some high profile “norm champions” (Fitzsimmons 2009; Green 2018a) and, as discussed, an “organisational platform” (Finnemore and Sikkink 1998) from which these champions can develop, promote, and facilitate implementation of the proposal around the world. Development of preliminary guidelines for the achievement of zonal statuses, and some preliminary consideration to MRV and certification standards and processes would also be useful.

In addition to these operational imperatives, two areas seem worthy of future attention by scholars at the nexus of the normative and empirical branches of the social sciences, particularly as FFFZs proliferate. First, more work is needed to understand the potential role of *normative change* in the broader dynamics of decarbonisation, including feedbacks between moral motivations/actions and economic incentives/actions.

Second, this paper has not considered all of the normative implications of operationalising the system of FFFZs and of the particular actions needed to become fossil fuel free—including the distribution of losses and gains associated with such actions, what transitional justice requires by way of consultation with and transitional assistance to those adversely affected, and the political feedback effects of different approaches to managing these transitional issues (on these issues, see Green 2018c).

My own instinct is that efforts to delegitimise the system of fossil fuel production and consumption ought (for both moral and political reasons) to be sensitive to distributions of power within that system when allocating moral responsibility. Norm entrepreneurs and states should therefore pay careful attention to the transitional issues faced by workers in fossil fuel industries, flow-on effects in regional communities in large fossil fuel producing/consuming regions, and low-income households, distinguishing these groups on principled grounds from fossil fuel companies and the relatively wealthy owners of fossil fuel or energy-intensive business and household assets, who should bear the brunt of losses associated with economic transformation. But there is important work to be done at the intersection of

normative political theory and empirical social science to define and develop transitional arrangements that are both fair and politically effective as we move to free ourselves from fossil fuel entanglement.

References

- Alinsky, Saul. 1989. *Rules for Radicals: A Primer for Realistic Radicals*. New York: Vintage.
- Andonova, Liliana B., Michele M. Betsill, and Harriet Bulkeley. 2009. "Transnational Climate Governance." *Global Environmental Politics* 9(2): 52–73.
- Bernstein, Steven. 2000. "Ideas, Social Structure and the Compromise of Liberal Environmentalism." *European Journal of International Relations* 6(4): 464–512.
- Bomberg, Elizabeth. 2012. "Mind the (Mobilization) Gap: Comparing Climate Activism in the United States and European Union." *Review of Policy Research* 29(3): 408–30.
- Brysk, Alison. 1993. "From Above and Below: Social Movements, the International System and Human Rights in Argentina." *Comparative Political Studies* 26(3): 259–85.
- Chan, Sander et al. 2015. "Reinvigorating International Climate Policy: A Comprehensive Framework for Effective Nonstate Action." *Global Policy* 6(4): 466–473.
- Climate Change Communication Advisory Group. 2010. *Communicating Climate Change to Mass Public Audiences*.
- Collier, Paul, and Anthony J. Venables. 2015. "Closing Coal: Economic and Moral Incentives." *Oxford Review of Economic Policy* 30(3): 492–512.
- Corner, Adam, Ezra Markowitz, and Nick Pidgeon. 2014. "Public Engagement with Climate Change: The Role of Human Values." *WIREs Climate Change* 5(3): 411–22.
- Edenhofer, Ottmar, and Matthias Kalkuhl. 2011. "When do increasing carbon taxes accelerate global warming? A note on the green paradox." *Energy Policy* 39(4): 2208–12.
- Falkner, Robert. 2016. "The Paris agreement and the new logic of international climate politics." *International Affairs* 92(5): 1107–25.
- Finnemore, Martha, and Kathryn Sikkink. 1998. "International Norm Dynamics and Political Change." *International Organization* 52(4): 887–917.
- Fitzsimmons, Scott. 2009. "A Rational-Constructivist Explanation for the Evolution and Decline of the Norm against Mercenarism." *Journal of Military and Strategic Studies* 11(4): 1–35.

- Goldblat, Jozef. 1997. "Nuclear Weapon Free Zones: A History and Assessment." *The Nonproliferation Review* 4(3): 18–32.
- Grady-Benson, Jessica, and Brinda Sarathy. 2015. "Fossil Fuel Divestment in US Higher Education: Student-Led Organising for Climate Justice." *Local Environment* 21(6): 661–81.
- Green, Fergus. 2018a. "Anti-Fossil Fuel Norms." *Climatic Change* 150: 103–16.
- . 2018b. "Comment: The Logic of Fossil Fuel Bans." *Nature Climate Change* 8: 449–51.
- . 2018c. "Transition Policies for Climate Change Mitigation: Who, What, Why and How." Working Paper #1807, Centre for Climate Economics and Policy, Crawford School of Public Policy, Australian National University.
- Green, Fergus and Richard Denniss. 2018. "Cutting with Both Arms of the Scissors: The Economic and Political Case for Restrictive Supply-Side Climate Policy". *Climatic Change* 150: 73–87.
- Gunningham, Neil. 2017. "Review Essay: Divestment, Nonstate Governance, and Climate Change." *Law & Policy* 39(4): 309–24.
- Hale, Thomas. 2016. "'All Hands on Deck': The Paris Agreement and Nonstate Climate Action." *Global Environmental Politics* 16(3): 12–22.
- Hamel-Green, Michael. 1998. "The South Pacific—The Treaty of Rarotonga." In *Nuclear Weapons-Free Zones*, ed. Ramesh Thakur. Basingstoke, UK: MacMillan Press.
- Heal, Geoffrey, and Howard Kunreuther. 2012. "Tipping Climate Negotiations." In *Climate Change and Common Sense: Essays in Honor of Tom Schelling*, eds. Robert W. Hahn and Alistair Ulph. Oxford: Oxford University Press, 50–60.
- Hopke, Jill E. 2016. "Translocal Anti-Fracking Activism: An Exploration of Network Structure and Tie Content." *Environmental Communication* 10(3): 380–94.
- Jacquet, Jennifer. 2015. *Is Shame Necessary? New Uses for an Old Tool*. Pantheon.
- Jordan, Andrew et al. 2015. "Emergence of Polycentric Climate Governance and Its Future Prospects." *Nature Climate Change* 5(11): 977–82.
- Kerr, Suzi, and Vicki Duscha. 2014. "Going to the Source: Using an Upstream Point of Regulation for Energy in National Chinese ETS." *Energy & Environment* 25(3): 593–612.

- Lazarus, Michael, and Harro van Asselt. 2018. "Fossil Fuel Supply and Climate Policy: Exploring the Road Less Taken." *Climatic Change* 150: 1–13.
- Leiserowitz, Anthony a., Robert W. Kates, and Thomas M. Parris. 2006. "Sustainability Values, Attitudes, and Behaviors: A Review of Multinational and Global Trends." *Annual Review of Environment and Resources* 31(1): 413–44.
- McAdam, Doug. 2017. "Social Movement Theory and the Prospects for Climate Change Activism in the United States." *Annual Review of Political Science* 20: 189–208.
- Ostrom, Elinor. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge, UK: Cambridge University Press.
- . 2014. "A Polycentric Approach for Coping with Climate Change." *Annals of Economics and Finance* 15: 71–108.
- Piggot, Georgia, Peter Erickson, Harro van Asselt, and Michael Lazarus. 2018. "Swimming upstream: addressing fossil fuel supply under the UNFCCC." *Climate Policy* <https://doi.org/10.1080/14693062.2018.1494535>.
- Sinn, Hans-Werner. 2008. "Public Policies against Global Warming: A Supply Side Approach." *International Tax and Public Finance* 15(4): 360–94.
- . 2012. *The Green Paradox: A Supply-Side Approach to Global Warming*. Chicago: The MIT Press.
- Sunstein, Cass R. 1996. "Social Norms and Social Roles." *Columbia Law Review* 96(4): 903–68.
- Thakur, Ramesh, ed. 1998a. *Nuclear Weapons-Free Zones*. Basingstoke, UK: MacMillan Press.
- . 1998b. "Stepping Stones to a Nuclear-Weapon-Free World." In *Nuclear Weapons-Free Zones*, ed. Ramesh Thakur. Basingstoke, UK: MacMillan Press, 3–32.
- van der Ploeg, Frederick, and Cees Withagen. 2012. "Is there really a green paradox?" *Journal of Environmental Economics and Management* 64(3): 342–63.
- Weick, Karl E. 1984. "Small Wins: Redefining the Scale of Social Problems." *American Psychologist* 39(1): 40–49.