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**Article**

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Journal of Contextual Economics – Schmollers Jahrbuch

**Provided in Cooperation with:**

Duncker & Humblot, Berlin

*Suggested Citation:* Novak, Mikayla (2019) : Climate Change: What Should Liberals Do?, Journal of Contextual Economics – Schmollers Jahrbuch, ISSN 2568-762X, Duncker & Humblot, Berlin, Vol. 139, Iss. 2-4, pp. 325-348,  
<https://doi.org/10.3790/schm.139.2-4.325>

This Version is available at:

<https://hdl.handle.net/10419/292561>

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# Climate Change: What Should Liberals Do?\*

By Mikayla Novak\*\*

## Abstract

Ecological sustainability issues, including the desire to ameliorate climate change impacts upon economic, social and political systems, figure prominently in twenty-first century public discourses. Despite growing community agreement over the need to avert the worst effects of climate change, a perceived lack of political progress in advancing multilateral climate-change policy is fueling dissatisfaction over the capacity of technocratic administration to deliver solutions to tackle this deep-seated and, for some, existential problem. We draw upon classical liberal insights, and utilize the contextually-aware systems approach of “entangled political economy,” to consider a constructive case for actions on climate change.

*JEL Codes: B5, D7, K3, Q4, Q5, Z1*

## 1. Introduction

Environmental considerations were hardly a major topic during the recorded discussions that took place during the Colloque Walter Lippmann (CWL), held in Paris in 1938 (Reinhoudt and Audier 2018). On the fourth day of the CWL proceedings, Alexander Rüstow posed a case for “vital integration” of people not only with a productive, market-based economy, but with extra-economic aspects conducive to human well-being such as a connection with land and nature. In his opening address, Walter Lippmann himself referred to the need to “discover the ideas that permit the momentum [*élan*] toward freedom and civilization to triumph over all the obstacles resulting from human nature, historical circumstances, *the conditions of life on this earth*” (*ibid.*, 105; emphasis added).

The CWL attendees were doubtlessly motivated to address the exigencies of their time, seeking to enhance the normative relevance of liberalism during an age in-

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\* The author wishes to thank two anonymous referees for their helpful suggestions in response to a draft version of this paper.

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creasingly gripped by economic, social and political crises. In particular the CWL was typified by its dedication to the contextualized aspects of liberty, accounting for certain broader features of human existence which both enables and constrains the exercise of individuals to act, choose, and to be.

Whereas matters directly relating to ecology received, at best, a hearing of a fleeting nature during the CWL proceedings of 1938, it is unquestionable that the place of ecology within contextual appreciations of economic phenomena has risen markedly since. There has been a tremendous growth in environmental consciousness in both developed and developing countries since the 1960s. This has been manifest in terms of specific concerns such as the threat of extinction to fauna and flora, the impacts of chemical dispersal and product waste upon ecosystems, the need to conserve natural landscapes and marine environments, and to maintain the quality of natural resources such as air and water. Over the past three decades the issue of climate change has arisen as contender for the central environmental issue confronting humankind, with significant ramifications for economic organization as well as for those institutional structures which order our social and political affairs.

This article seeks to interpret the nature and significance of climate change through a liberal prism. We recognize that the value of liberal thought toward environmental matters continues to court controversy, including amongst those immersed in the development of “deep ecology” or “green” philosophies. Broadly speaking, for many of liberalism’s critics any liberal commitment to material accumulation and economic growth is seen as deeply implicated in the rapid production of greenhouse gases (GHGs): “[o]ur carbon-saturated world is the hangover of a 150-year party in which, until the very end, we believed we had achieved the dream of liberation from nature’s constraints” (Deneen 2018, 15). For a figure such as Deneen, and those who share similar opinions, Lippmann’s sentiment – i. e., the realization of human liberty necessitates a “release” from a constraining ecology – may well be problematically representative of attitudinal dispositions which leave climate change unabated.

In this paper the position is taken that climate change is an actually-occurring phenomenon, and that human activities (especially in relation to production and, to a lesser extent, consumption) are a factor in the warming of the planet resulting from greater concentration of GHGs in the atmosphere. Mainstream scientific views concerning the anthropogenic contribution to climate change, and the impacts of unaddressed climate change – including for global temperatures, extreme weather events, ocean acidity, ecosystem damage and species loss – is accepted (IPCC 2014; IPCC 2018). Our primary purpose is to advance the view that liberalism can provide a constructive framework through which climate change responses may be contextually understood. The capacity of individuals and groups (on an economic, social or political basis) to both adapt, and work, to mitigate climate change effects crucially hinges upon the freedom to reorient economic practices, social norms and other relevant matters in efforts to slow, if not eventually halt, the GHG disseminations that influence climate change.

The structure for this article is as follows. Section 2 will provide a brief discussion about key aspects of climate change science and outline the political economy framework adopted in this article. This will be followed by a critical discussion of principles for a climate policy framework consistent with liberal principles (section 3). Section 4 outlines the important contributions of moral (or norm) entrepreneurs toward public acceptance of the need for climate change to be addressed, situating such instances of entrepreneurship within cognitive-psychological parameters focusing on framing techniques to solicit society-wide commitments toward climate action. A brief set of concluding remarks follows.

## 2. The Need for Contextual Understanding of Climate Change

The scientific basis for the proposition that GHGs, such as carbon dioxide (CO<sub>2</sub>), methane and nitrous oxide, may induce an increase in the mean global (surface) temperature is well established. Important figures in the history of modern physical sciences, such as Fourier, Tyndall, and Arrhenius, hypothesized that increasing GHG concentrations in the atmosphere are contributing factors toward warming (Le Treut *et al.* 2007; Emanuel 2016). Prior to the British Industrial Revolution of the early nineteenth century the global average CO<sub>2</sub> concentration was 280 parts per million (ppm), subsequently increasing to 330 ppm prior to World War I and, recently, in excess of 400 ppm (NOAA Research 2013; Dockrill 2019). Notwithstanding uncertainties surrounding climate science – such as the GHG absorptive capacity of oceans, the impacts of cloud cover, and so on – leading scientific authorities predict, in the absence of mitigating actions, continuing growth in GHG concentrations which, in turn, contribute to climate change (putting aside the path-dependent effect of existing atmospheric concentration upon changes to global climate).

Based on the available evidence, including impacts already being experienced globally, unaddressed climate change is anticipated to cause a range of severe (if not catastrophic) impacts on bio-physical systems. Warming temperatures are contributing to an accelerated melting of glaciers, ice caps, permafrost and sea ice, and it is believed to be a factor informing heat temperature records in both the Northern and Southern hemispheres. Climate change also contributes to volatility in weather patterns, and whose impacts are anticipated to be felt unevenly around the globe (e.g. prolonging droughts and fire events in some regions, but more frequent and severe storms for others). Humans have a creative capacity to adapt to climate change (within reasonable bounds), however it is less clear that fauna and flora – including the many species whose evolutionary development rely upon unique climactic conditions or reliable weather patterns – possess similar adaptation potential.

A certain propensity in modernist philosophical thought is to conceive elements of the natural world, including the Earth's climate, and human activities as separated

domains. However, it is well understood by governments, businesses and the general public that the climate change problem has profound economic impacts and even broader implications for human well-being. There are, for instance, numerous studies investigating the effect of heat (including associated with climate change effects) on economic productivity, mortality and other facets of material prosperity and general welfare (e.g. Masters and McMillan 2001; Horowitz 2009; Wehner *et al.* 2017; Geruso and Spears 2018). By the same token there is a growing scientific appreciation that the human-environment relationship is of a bilateral character, meaning that human activities also have a major imprint on global environments including the climate system (Persson *et al.* 2018).

Adding to this already complex picture is the notion that both environmental and economic systems are fundamentally governed by evolutionary processes. Authors such as DiZerega (1996; 2018), Lamey (2015) and Regan (2015) trace similarities between the ecological and environmental processes of the natural world and those pertaining to human economic, political and social orders. A central implication of such work is that the connective threads of evolutionary principles challenge the perception of separability – if not estrangement or even antagonism – between humanity and the world around us. The nature and implications of climate change which extend across the orders of natural and human realms calls for conceptual frameworks defying ontological and epistemological siloing and compartmentalization. The challenge of climate change similarly demands greater recognition of the interdependence between natural and social phenomena, and those sciences aiming to understand them.

Recent developments in “contextual economics” (Goldschmidt *et al.* 2016; Kolev 2019) are promising, particularly its encouragement of a broader frame for analyzing human phenomena and the due recognition of the significance of socio-economic transformations as a focal point for investigation. Certainly, with regard to the point about transformation, climate change has a clear potential to invoke fundamental changes to the way in which people carry out their activities economically, socially and politically. We also think there is merit in investigating the significance of climate change from the perspective of entangled political economy (Wagner 2016; 2019). Entangled political economy conceptualizes economic activity as evolutionary process of networked interactions between individuals and groups. Specifically, it perceives economic activity as conducted on the same plane as other manifestations of human action, broadly understood. Therefore, entangled political economy refutes the tendencies of conventional economics to maintain a rigid categorization between the concepts of economy and polity. As noted by Wagner, “entangled political economy denotes a scheme of thought which denies the independence of political and economic action, holding instead that politics is as much a part of prudent economic action as economics is a part of prudent political action” (2019, 1).

Certain facets of human existence have a massive bearing upon the configurations and integrity of interactive structures emerging within an entangled political economy

approach. The preparedness of humans to intermingle with one another – and in ways which impact (and are impacted by) the environment – are indelibly shaped by socio-cultural norms and values about what are desirable and appropriate methods of engagement with others. Going even further, this framework has a capacity to conceptualize human interactions as being implicated with the ecological. In other words, entangled political economy is usefully seen as *contextualizing* economic activity with the physical environment, resources, and ecology upon which human existence, and all life for that matter, both influences and depends. Finally, this framework gives consideration to the outcomes arising from the interplay of multiple centers of relatively autonomous human decision-making, coordination and governance. Incidentally, this notion of “polycentric” ordering was developed by CWL participant Michael Polanyi during the 1950s and notably refined later by Elinor and Vincent Ostrom.

From a normative standpoint we all have a stake in the condition of our shared planet, and this includes the *desideratum* that the climate upon which we rely is as hospitable to life as possible. Even a prominent American conservative commentator was led to remark in the early 1970s that “the issue of environmental quality is one which transcends traditional political boundaries. It is a cause which can attract, and very sincerely, liberals, conservatives, radicals, reactionaries, freaks and middle class straights” (Russell Kirk cited in Nader 2014, 112). Even so, ecological concern can intersect or overlap with diverse economic, financial and other concerns held by heterogeneous individuals and groupings, exposing the varied (and often times competing) interests, values and understandings concerning the salience of climate change.

Interaction between people may bring about opportunities to cooperate on climate change mitigation or adaptation strategies but, then again, under certain circumstances the intermingling of individuals and groups may yield competition – even antagonism and discord – about how to address climate change. The prosecution of interests and ideas amongst the entangled many concerning climate change will be modulated through the lens of culture, economics, law, policy, science and society. The inherent complexities this entails is most likely to yield emergent outcomes, often of an unexpected or even surprising nature which cannot be reliably predicted on an *ex ante* basis. Some of these outcomes will be received adversely (for example, the 2017 announcement by the American Trump administration that it intends to withdraw from the Paris Agreement) whilst others will be comprehended more favorably (for example, the intersection of endogenous preferences and entrepreneurship facilitating the development of renewable energy technologies), depending upon one’s point of view.

From an entangled political economy approach, the human response to climate change reflects an emergent by-product of interactions synergistically operating across nested economic, social, legal, political *and* ecological systems. To be illustrated in this article, the entangled webs with which we weave together – and in re-

lation to our planetary climate – will have significant implications for such matters as the directionality and rate of change of public policy, market responses and social attitudes.

### **3. Toward a Contextualized Policy Environment Addressing Climate Change**

#### **3.1 Market Failure Basis for Addressing Climate Change: A Critical View**

At the core of the conventional economic approach to climate change is a role for governmental policymaking, informed by the underlying objective of ensuring that economic agents recognize (and respond to) the costs of climate change. In essence, the climate change phenomenon is considered an instance of “market failure” distorting resource allocations, thus inhibiting potential gains from trade. Specifically, the GHGs contributing to overall climate change should be treated as a (negative) externality, in that producers and other emitters (e.g. workers driving their fossil-fueled motor vehicles to and from work) effectively treat the atmosphere as a sewer or sink, without due regard to the damages such emissions cause.

What strategy, or strategies, should be undertaken to ensure market-related economic activities reflect their social cost? For economists such as Arthur Cecil Pigou (1932 [1920]), the solution is to recommend government intervention into the economy so that costs incurred by third parties are countenanced in private economic exchanges, improving overall societal welfare as a result. To address the negative externality, it is suggested a tax should be imposed discouraging those aspects of production contributing toward GHG emissions. For our purposes we put aside the possibility of so-called “command-and-control” regulations similarly intended to discourage emitters from emitting.

It may be surprising for participants involved in climate change debates to learn that some of the major figures in modern liberalism – such as Carl Menger (Streissler 1990) and Friedrich August von Hayek (2007 [1944]; 2006 [1960]) – supported public policy efforts to rectify externalities, as had others such as the ordoliberal theorist Walter Eucken (2004 [1952]). In a recent reading of Hayek’s relevance to environmental policy it is suggested that Hayek saw a pragmatic role for public sector involvement, albeit with the qualifier that “interventions respect certain constraints to preserve the functionality of economic markets” (Shahar 2017, 88). These recommendations at first glance appear to provide allowance, even if on a qualified basis, for remedial policies contending with climate change.

The socio-political contentiousness wrought by proposed climate policy solutions in recent decades may be influenced, to some degree, by significant economic critiques of the conventional economic position toward externality and its public policy

treatment. The key critiques, though not exclusively so, have tended to emanate from figures commonly associated with economic liberalism.

Ronald Coase (1960) indicated that externality effects need not require government intervention for their resolution, provided that property rights are clearly specified and that the costs associated with transacting exchanges are sufficiently low. In the case of a negative externality, and assuming that harmed third parties can identify the transacting parties responsible for it, all parties may be able to reach efficient bargains (given the configuration of legal institutions) in which the social costs imposed become duly recognized in transactions. Emitters may pay non-emitters compensation for a continuing “right to emit” resulting from, or non-emitters may pay emitters to curtail, their emitting productions.

In the absence of face-to-face negotiations, some suggest those parties deleteriously affected by GHG emissions could seek recompense for damages through the legal system – again, provided that property rights, marking out the rights of emitters and non-emitters, respectively, are clearly specified (Adler 2009). In the view of some, therein lies the rub. As the global dimension of climate change readily suggests, GHGs are dispersed throughout the atmosphere and are not confined to a given political jurisdiction. The sheer improbability of precisely identifying the respective contributions of extensively-entangled actors emitting GHGs, and the consequent high transaction costs compromising the prospects for extensive Coasean bargaining and the operation of tort law in local or national courts (Nentjes 2005; O’Neill 2012), may inhibit large-scale attempts at legal redress. That said, a number of smaller scale legal challenges have taken place in recent years – primarily directed at either individual, or a well-defined set of, corporations or government authorities (Ganguly *et al.* 2018; Walls 2018; Setzer and Burns 2019). It remains unclear at this stage whether such actions would successfully enforce the enduring GHG mitigations necessary to stabilize and repair the global climate.

Scholars versed in “public choice” theory (and the related Chicago School of regulatory theory) question implicit presumptions to the effect that legislators and bureaucrats would implement fiscal or regulatory policies in the public interest (Tullock 1967; Stigler 1971; McChesney 1997). Specifically, governments would seek to implement policies which accord with the preferences of special interests rather than those of the general community as a whole. The endorsement of special interest prerogatives in climate change policy could manifest itself in numerous ways. For example fossil-fuel producers could persuade policymakers to frustrate the onset of climate change policies, or alternatively suggest designing policy to impede the entry of aspirant renewable-energy producers into the market. How interest group politics will play out in the climate change policy space will be contingent upon numerous factors, such as ideological profiles of political actors, administrative/governance rules concerning political engagement with vested interests, local economic conditions, natural resource availabilities, and so on.



Other economists, still, especially aligned more or less with the modern Austrian School, have raised another set of questions with applicability to climate change policy (e.g. Cordato 1999; Cordato 2004; Dawson 2011; Dawson 2013). A key objection centers upon the epistemic capacity of governments to effectually attend to externality effects; in effect, challenging the judgement of key forebearers such as Menger and Hayek. The modern Austrians critique policy efficacy on the view that policymakers are unable to acquire accurate and relevant knowledge about economic and related attributes driving the externalities. Furthermore, it is said policymakers lack appropriate insight to utilize policy instruments effectively or appropriately to achieve *ex-ante* policy outcomes – especially those as complicated as achieving emissions reductions for fugitive GHGs traversing political borders. As noted by Pennington (2011), such “knowledge problem” arguments are now often intertwined with the classic public choice arguments concerning political incentives (or lack thereof) to align with general public interests.

To be certain, most economists, even those working within the mainstream (neo-classical) economic paradigm, are aware of inappropriate outcomes arising from poor policy design and implementation. Even Pigou, commonly identified as progenitor of modern externality theory, wrote that:

[i]t is not sufficient to contrast the imperfect adjustments of unfettered private enterprise with the best adjustment that economists in their studies can imagine. For we cannot expect that any public authority will attain, or will even wholeheartedly seek, that ideal. Such authorities are liable alike to ignorance, to sectional pressure and to personal corruption by private interest. A loud-voiced part of their constituents, if organised for votes, may easily outweigh the whole (1932 [1920], 332).

The swings and roundabouts surrounding the appropriateness of the market failure paradigm (including the responses explicitly or implicitly dictated by it) leave us in a difficult position. Which set of claims regarding the market failure paradigm – yes or no, pro or con – should one accept? Part of the insufficiency of the market failure paradigm is its fixation upon matters of resource allocation *given* institutional structures and *given* coordination possibilities, yet greater attention upon those additional considerations does open the possibility for *learning* on the part of the policymakers and other relevant political agents. As stressed by scholars versed in the Bloomington School of political economy, those responsible for policy design and implementation in a given political jurisdiction are often able to take advantage of observationally diverse policy settings, in neighboring localities or abroad, to learn about different policies and instigate policy improvements based upon their learnings (Ostrom 2005; Yu 2011; Aligica *et al.* 2019). This assuredly provides the basis for a liberal orientation toward climate change policy, helping communities respond as our surrounding climate changes and, as briefly discussed in what follows, provides an *equivocal* case for carbon taxation (within this, most certainly a case for a high-accountability, transparent tax regime). In this respect, we stand with Menger, Hayek and Eucken.

### 3.2 International Policy Coordination: Challenges and Opportunities

Another possibility to which we now shall turn is whether a more effective response to climate change is (at least partly) a function of better coordination amongst institutionally-situated actors within the political domain. To put this differently, is it possible for lower-level political actors to coordinate upwards bringing about a global climate solution?

Policy discussion about climate change is predominantly informed by perceptions concerning the spatial extent of the problem. GHG produced within a given political jurisdiction may be dispersed by air currents across borders and is sequestered by the oceans, plants, in soils, and potentially among locations far distances away. Therefore, the scope and coverage of climate change effects which derive from the emissions are (non-uniformly) extra-territorial – indeed global – in dimension. Of course, it should be said that no one person or group in particular *owns* the atmosphere *qua* commons. However, accounting for the globalized attribute of the issues at hand and the widespread benefits associated with reducing GHG emissions, it is usually recommended that responsibility for climate change policy should be optimally mapped to international public governance institutions.

Following the success of the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer, phasing out production and trade of chlorofluorocarbons, nation-states agreed at the 1992 Rio de Janeiro “Earth Summit” to address anthropogenic influences upon the global climate system. The resulting United Nations Framework Convention on Climate Change (UNFCCC) stated the objective of stabilizing GHG concentrations and that, in meeting this objective, countries would proceed on the basis of common but differentiated responsibilities and respective capabilities (Stavins 2015, 36). After successive rounds of communiques and agreements in the early 2010s (including in Durban, South Africa and Doha, Qatar), the 2016 Paris Agreement was reached with the long-term objective of limiting the mean global temperature to below two degrees Celsius above pre-industrial levels. Each signatory country is required to declare the nature of the contributions they are to make respectively toward mitigating GHGs, and they are tasked with publicly reporting those results (Iacobuta *et al.* 2018; van Asselt *et al.* 2018).

It is with respect to these negotiations that hopes for effective climate change mitigation appear to have fallen well short thus far. In respect to the Kyoto Protocol, it is said it “has so far delivered little: it has not made any appreciable difference to climate change—nor would it have done, had it been fully implemented and the targets delivered” (Helm 2008, 212). There appears growing scepticism that even the latest Paris Agreement would be effective: “even with full implementation of cross-national mitigation options, such as through the Paris Agreement of 2015, recent estimates suggest that the temperature targets will be missed unless emissions are more sharply reduced” (Anderson *et al.* 2019, 2). Aggregate emissions rise in trend terms over the years featuring international political coordination efforts.

Whilst some of the key international mitigation agreements remain in effect, several explanations have been offered for the inadequacies of globally-coordinated political responses. Collective action theory would suggest that, given the benefits of climate change mitigation would be enjoyed by everyone, there is an incentive to “free ride” on the efforts of others to actively reduce GHGs. Many developing countries (including China and India) were exempt from Kyoto Protocol provisions, whilst the United States (one of the largest GHG polluters in the world) refused to ratify that Protocol. As mentioned previously, the United States expressed its intention to withdraw from the Paris Agreement in 2017.

The Kyoto Protocol has come under additional criticism for being a “top-down” agreement, legally binding developed countries to shoulder more of the relative burden of climate change mitigation. What this suggests is global climate deliberations had transcended into distributional conflict between nation-states, with “strong conflicts of interest and fragmentation of power and capability” (Keohane and Victor 2015, 201). International climate change negotiations are also tinged with discourses pertaining to global economic justice, compounding the difficulties of reaching international consensus (Dryzek *et al.* 2011).

Controversies over the appropriateness and effectiveness of international policy coordination on climate change will doubtlessly continue. From an entangled political economy perspective, international negotiations serve as a site not only for potential coordination but of contestation. Not only do participating countries bear divergent interests – reflecting such matters as resource endowments and industrial structure, as well as domestic political dispositions toward climate change policy – but, as noted earlier, the ability to strike highly-detailed, prescriptive policy bargains are probably compromised by the uneven bio-physical and economic impacts of climate change.

It is in recognition of these difficulties that the value of polycentricism perspectives comes to the fore. Elinor Ostrom (2009; 2012a; 2012b) saw the proliferation of polycentrically-ordered policy action as a pivotal component of climate change strategy, given the brinkmanship and delay associated with international political negotiations. “Given that many of the actions generating greenhouse gas emissions are taken at multiple scales,” Ostrom said, “activities could be organized at multiple scales, ranging from households, farms, and cities at a local scale to regions within a state, states, regional units that cross state boundaries and the globe” (2009, 16). In other words, a polycentric approach provides effective endorsement of robust approaches to climate change mitigation in the event that international agreements or negotiations break down.

Polycentricity is not without its detractors. Some would argue that polycentric approaches toward climate change policy could generate unwarranted inconsistencies, and perhaps induce cross-border GHG “leakages” attributable to capital mobility toward jurisdictions with “light-touch” climate policies. Whilst duly recognizing that polycentric orders have their own limitations, there is still much to be said in favor of this approach from a liberal perspective. Allowing a degree of au-

tonomy in terms of climate change responsiveness enables the tailoring of efforts to deal with the local and variable ramifications of climate change, soliciting a greater commitment “to finding ways of reducing individual emissions” (*ibid.*, 39). The resulting “ecology” of policy experiments, emanating from multiple levels of decision-making, expands the domain of knowledge regarding climate change rectification. This accumulation of knowledge provides, as already mentioned, a burgeoning menu of learning opportunities for potential emulators. Ostrom’s polycentric insights have spawned immense interest from climate change policy researchers in recent years (e.g. Cole 2015; Jordan *et al.* 2018; Turnheim *et al.* 2018).

The intent of this discussion is not to dismiss the place of international climate change negotiations, but to suggest such negotiations (as important as they are) should not come to represent the sole political focal point for climate policy development. The reality of entanglement – forged as a result of diverse natural ecologies, production systems, governance structures and institutional edifices – suggests there is no “one-size-fits-all” solution to climate change. What polycentric principles do suggest is not only a modicum of space for the multitude of economic, civil societal and political actors to work their climate change solutions interactively, but the prospect for cross-national political agreements to be concertedly built from the “ground up.”

In this context a model similar to that suggested by Nordhaus (2015), in the form of “climate club” alliances of nation-states, may be worthy of further investigation. Under such a polycentric-friendly approach to political coordination, the performance of each member in reducing GHG emissions is monitored and the membership of additional nations may be accommodated as the circumstances see fit. To ease the costs of goods and services, trade coordination amongst the different climate clubs – whilst maintaining inter-club diversity of policy settings – and “mutual recognition” policies may be established (OECD 1994). Needless to say, signatories to climate club arrangements (and the club organizations as a whole) would also need to retain a nimble and flexible policy posture to respond to shifting climate change patterns.

### **3.3 Climate Policy Principles for Nation-States and Sub-National Political Jurisdictions**

In advancing the proposition of a climate policy respectful of liberal principles, we recognize the significance of institutional structure in shaping not only economic but ecological outcomes. The salience of a liberal view toward environmentalism is markedly illustrated by the ecological disasters under socialist and communist regimes featuring a most extensive degree of entanglement between economic and political orders (Hill 1992; Pennington 2011; Quiggin 2019). There are good reasons to consider that climate change policies are more likely to succeed under market-oriented liberal democracies – given their citizen-voter political accountabilities, feedbacks between supplier-and-demander and citizen-and-state, diversity in pro-

duction and public governance structures alike, not to mention the co-existence of entrepreneurial flair and policy adaptation responding to unfolding situations.

A liberal approach to climate change policy is indelibly informed by an appreciation of policy outcomes as a function of the quality of overarching rules structuring the domain within which policies are created and enforced (Brennan and Buchanan 2000 [1985]). For our purposes this insight is applicable to the design and implication of policies at the national and sub-national level of public governance, but it is also relevant to the field of international policy coordination. In any event, we take our first principle of policy reform to be that governments formulate clear *framework policies* (duly reflected in legislation, regulation, and other relevant activities of government) signaling a long-term commitment to reducing GHGs, as well as to transparency and accountability mechanisms to monitor progress over the life of successive governments (NZPC 2018).

From a liberal policy standpoint it would also be essential that such climate policy frameworks outline a commitment toward rules maintaining the integrity of market-oriented coordinative mechanisms and institutions (e. g. property rights, functioning relative prices, freedom of contract, economic openness). Considering the significant adjustments to be made to capital and production structures in order to respond effectively to climate change (Faber and Winkler 2006), sound framework policies providing greater certainty to entrepreneurs, investors and other productive actors to adopt climate-friendly production processes and technologies will be vital.

In recent years there have been growing numbers of voices calling for significant prioritization of public (and private) resources toward green innovation. The idea is this strategy would facilitate switching towards cleaner technologies and processes generating far less, or perhaps even no, GHG emissions. We agree there should be an emphasis upon *innovation* as a core public policy strategy dealing with climate change, albeit conducted in a structured fashion in accordance with liberal precepts. Drawing upon Cantner and Vannuccini's (2018) model of catalytic research and innovation policy, the government may outline a broad aspiration to elicit interest in the direction of GHG-abating technologies and practices but, *importantly*, the private sector needs to be the protagonist and assume the lead role undertaking actual innovative activities.

For an innovation policy style of this nature to work effectively the government's role is not to flout epistemic limitations by selecting the "winners" from climate-friendly innovation. In other words, appropriate policy in this space "does not show excess inertia; rather, it is one that can balance intervention and the working of market mechanisms" (*ibid.*, 848). This policy disposition is not dissimilar to the demand that policymakers enable market participants themselves to take on the substantive risks to discover satisfactory climate solutions (Thierer 2016).

At the risk of arousing controversy, we also come down on the side of arguing for a place for *carbon taxation* within the broader frame of a liberal response to climate change. As is well known to economists, changes in relative prices provide important

information to economic actors to adjust their behavior and reallocate resources. Accordingly, many (though not all) agree that the effect of relative price changes exuded by a carbon tax is anticipated to redirect economic activities toward those which reduce emissions (Humphreys 2007). In this sense carbon taxes, which would help engender “climate-sensitive economic calculations,” should usefully complement an innovation policy geared toward discovering and commercializing cleaner, greener technologies.

In endorsing this position we assume an “unromantic” view of politics and policymaking (Buchanan 2003). To facilitate greater electoral agreeability toward the need for a carbon tax regime, very careful consideration should be given to the appropriate disposition of revenues – particularly addressing the economically distortionary effect of the tax, or the associated financial hardships felt by those on lower incomes. Recognizing that taxes create political attachments and re-attachments between emitters, bureaucrats and legislators, which could yield unintended (and potentially harmful) consequences (Hebert and Wagner 2013), it is also recommended that periodic “sunset-and-review” clauses be enshrined in enabling legislation to promote public scrutiny of carbon taxation effectiveness.

From an entangled political economy perspective it should be apparent that the activities of the public sector are deeply implicated in the problem of climate change. That is to say, public sector production and service provision is enmeshed with economic activities conducted within markets and elsewhere, all of which contribute to GHG emissions. Large-scale public ownership of electricity generation, which in numerous countries predominantly rely on fossil fuels such as coal, generates GHGs; meanwhile fossil fuel production continues to receive extensive subsidy supports today (Skovgaard and van Asselt 2019). The public sector has also traditionally provided subsidies, tax breaks and regulatory relief to GHG-intensive industries in agriculture, construction, manufacturing and elsewhere. Such policies not only expand the GHG emissions profile of national economies, but implicitly act as barriers against the propagation of cleaner technologies.

A consequence of such entanglement is that attribution of unsatisfactory outcomes cannot be directed solely toward the market or the state. As noted by Furton and Martin, “[m]arket and political activities are deeply intertwined, meaning that real-world instances of failure rarely can be described as wholly private or wholly public in origin” (2019, 209). Nonetheless, it is possible to identify a class of policy reforms – aptly described as *negative policy experiments* (Potts 2010) – which help reduce the (direct and indirect) contribution of government toward the climate change problem. In essence these may involve: the elimination of subsidies to fossil fuel concerns and other GHG-intensive emitters; the removal of barriers to entrepreneurial experimentation with clean (and, perhaps, small-scale) energy production techniques in solar and elsewhere (Kiesling 2010; Kiesling 2012); and the removal of policy and regulatory barriers to adaptation by individuals, households and businesses more generally (Australian Productivity Commission 2012).

Much of the focus in this section has been on policy contributions toward climate change mitigation. As has been well established in the climate change literature there is also a need for *adaptation* for the effects of a warming climate. It is expected that markets will provide an important impetus for adaptation efforts, particularly to the extent that changing relative prices in areas such as energy, insurance and transportation incentivize individuals and groups to change production and consumption practices. Of course, markets also enable people to entrepreneurially engage in experiments to better cope with climate change and to obtain feedback from practical experiences about what works and what does not work.

There may also be instances wherein governmental action may be necessary to facilitate climate adaptations, especially at a regional or local level wherein climate impacts are endured in varied ways. Such strategies may include changes to emergency management procedures (to cope with wildfires or coastal inundations), public infrastructure improvements, as well as the promotion of robust market mechanisms in sectors, such as water, to economize on the use of scarce resources. An issue which is likely to become more pressing in the years and decades to come is the need for people in low-lying areas, such as small island nation-states, to migrate, which may be accommodated by governments in the form of liberalized migration policy settings. More fundamentally still, a growing economy is important as it provides the additional resources needed to assist individuals, households, firms and other participants in entangled political economy to engage in adaptation to a warming climate (Mendelsohn 2006; Heath 2016).

#### **4. Taking Contextualism Further: Bringing the *Social* into Climate Change**

It appears a major objection by environmentalists toward the economy in general, and the potential for market-oriented solutions, is that economic action is held responsible for those GHG emissions which contribute to a problem as serious as climate change. Capitalism is a “climate-wrecking machine,” according to this account, and must be brought to heel through de-growth and similar strategies limiting the scope of market activity. Of course, there are contrary views, borne of religious precepts, tradition and other values, to the effect that nature is bountiful and beneficial, available for ready use by human beings (including as an input into production), or that the environment is dangerous and must be subjugated to realize human comfort. Regardless of which one of these broad views is taken as truth, economy-environment separability assumptions imply that questions of economic development and environmental sustainability are quintessentially at loggerheads with each other.

Debates over appropriate responses to climate change have infused public discourses for three decades or so. Whilst there are many subtle differences in viewpoints about climate change, the general tendency has been to identify two broad “world-



views” on the issue. There are, first, those who accept the need for climate action, and, then, those who do not. These contending world-views not only establish an ideational basis for understanding responses to climate change, but the proponents of each viewpoint seeks to persuade others within society of the merits of their view (and the demerits of the other). Contending groups on the climate change question can voice their concerns and solicit more supporters to their cause in numerous ways, say, through petitioning, protest action, publications and media engagement, voting, and so on.

Climate talk is contentious; often deeply so. In essence, “[w]hat we observe is not a logical discussion but a struggle between existing adopters of both socio-cultural, e. g., religious, and economic (e. g., a belief in maximal economic growth) meso rules versus adopters of an emergent meso rule that we must act to mitigate climate change” (Potts *et al.* 2010, 381). To some extent the condition of policy trajectories in response to climate change – as well as non-state courses of action by businesses, community groups, etc. – is influenced by the manner in which this discursive contentiousness plays out in society (Brennan 2009; Almudi *et al.* 2017). Even more broadly speaking, the breadth and intensity with which people seek to communicate their climate change perspectives, both individually and collectively (say, through social movements), provides important informational value for the remainder of society’s members to observe and interpret.

Research into the properties of climate change discourse may tend to employ the reductive binary of “climate alarmist” and “climate denier” for analytical simplicity, but the reality is more complicated. To put simply, the intensity of commitment to any given world-view, even on a matter such as climate change, is both variable and contingent. Indeed, observed engagement in the cut-and-thrust of “utopic contentiousness” suggests that it is possible to expand the size of a meso-level population towards certain perspectives about climate change, and reduce the meso-level population of proponents for alternative viewpoints. To put simply people do have the capacity to switch views, building from the bottom-up a constituency for eventual policy change (or the inaction of the policy *status quo*). It is difficult to understate the long-term importance of this social dynamic for reducing the perspectival sense of “social tectonics” (Wagner 2016) surrounding climate change discussions, and to create favorable pathways for feasible climate policy.

Climate discourse is framed by contestation over values, but under what circumstances might it be observed that growth in the number of those supporting climate change action occurs? Schmidt (2000) and Shahar (2016) argue that developing a mass-public for climate action critically hinges upon discovering discursive methods of conciliation and agreement rooted in respectful acts of persuasion between those maintaining contrasting world-views, rather than conflict and resistance seeking to stratify the world into “winners” and “losers.” As stated by Shahar when referring to strategies adopted by environmentalists, “[b]y deferring to nonenvironmentalists’ commitments rather than trying to override them, a conciliatory approach to envi-



ronmental politics would seek to turn adversaries into allies and to cultivate cooperation and respect among the currently rival groups” (*ibid.*, 247).

A voluminous literature in sociology and psychology provides the insight that the degree of collective agreeability with respect to a given issue, in turn establishing a basis for mobilization for common cause, is affected by the manner in which underlying arguments are framed. A potential way to proceed through climate change discourse is to frame the matter as one of risk management in the interest of maintaining a stable climate hospitable to human activity and life on Earth (Dolan 2016), or insurance against the realization of downside risks (Weitzman 2011). The insurance argument may be adopted not only with respect to mitigation strategies, but also with regard to adaptation efforts, with the costs borne today reflected in the minimization of greater harms endured (or the avoidance of stringent fiscal or regulatory responses) in the future. There are other methods of framing climate change policy and related actions – for example, “think about the potential cost of transitioning to a low carbon economy as an investment, rather than as a net-cost on the economy and taxpayers” (NZPC 2018, 11).

Added to this kind of discourse is the existence of co-benefits to be derived from the appropriate management of, or prudent insurance against, climate risks (Marron 2015; Mayrhofer and Gupta 2016; Driesen 2019). The co-benefits of tackling climate change are potentially wide-ranging, with some including: improved air quality (leading to reduced mortality and respiratory-related illnesses); improved energy security consequent to a reduced dependence upon fossil fuels; jobs creation and wealth-generating opportunities in an expanded “green economy;” and improved quality of life associated with avoidance of extreme temperatures and weather events, as well as the conservation of forests, oceans, and fauna and flora.

The economic discussion of climate change is predominated by debates over the costs of climate change action, and the willingness (or otherwise) of individuals and businesses to bear the costs of mitigation. A contextualized approach to climate change would suggest that an exclusive reference to costs needs some qualification. As suggested by Colander and Kupers: “[w]ithout a major change in norms, any climate policy will be ineffective. So the debate about climate policy should be a debate about costs and benefits within a system with evolving norms, not a debate about costs and benefits within existing norms” (2014, 191). A subjectivist approach would indicate that whether the costs of climate action are unbearable is, ultimately, determined by individual perceptions as to whether such costs are acceptable (including as assessed within a broader frame of (co-)benefits). To express this in another way, “if people have climate-friendly tastes, then there is little cost to dealing with the problem of climate change” (*ibid.*, 191).

The upshot of this commentary is that the manner in which we communicate about climate change is posited to have a considerable impact upon the comprehension and acceptability of climate change as a problem. The degree of social acceptability regarding the need to tackle climate change is posited to influence the perceived fea-

sibility of more assertive economic, social and political actions. It is a consequence of this reality of interdependence between the social and the economic that we can reaffirm the value of markets. As concern about climate change effects rise, consumers become increasingly active agents signaling their tastes for goods and services helping to reduce GHG emissions (e. g. renewable energies), and suppliers have the opportunity to constructively respond in a manner that is both welfare-enhancing and environmentally sustainable (Fatas-Villafranca *et al.* 2019).

## 5. Conclusion

The discussions outlined in this paper are not intended to provide a totalizing or definitive account of the climate change phenomenon and of its multitudinous impacts upon the integrity of natural and human orders. It is also accurate to suggest that there are many intellectual “shades” attached to liberalism which have not been addressed, at least to any great extent. These shades range from anarcho-capitalist dictums stressing the potential for interpersonal bargaining to repress climate harms to contractarian insights relating to the need to discover just mechanisms to abate GHG emissions.

Our intent is to simply illustrate that a liberal response to climate change does not represent effectively a “null set” of unresponsiveness to what is widely agreed to be a significant issue of environmental integrity. Entangled political economy provides the conceptual platform to more deeply investigate the dimensions of climate change, using the benefits of a broader analytical window on human interaction in a dynamic sense than what conventional economic approaches might allow. This insight links well with Ostrom’s polycentricity concept, with implications for such matters as: (i) the cultivation of ever-inclusive international agreements on climate change mitigation, (ii) “green economy” entrepreneurship and the innovative development of “climate markets” at home, and (iii) the micro-social mobilization of social movement organizations and other civil societal actors to encourage others to take action on climate change.

The concern amongst some who cherish the maintenance of a liberal order would doubtlessly relate to how additional governmental action against climate change may align with issues like economic freedom in the future. This is not an illegitimate concern, however what is essential is that those of liberal philosophical or ideological persuasion engage constructively in climate change dialogue, including with those who hold alternative viewpoints. Much like the CWL participants who adventurously sought to develop a liberal response to the issues of their times, liberals of today have an opportunity to be involved in arguably the major issue of our times: climate change. Given that climate change is both real and significant, and that humankind is contributing to the problem, a deliberate (even willing) abstention by liberals from the

discursive scene would serve as a dereliction of their ultimate commitments to human health, prosperity and well-being.

## References

- Adler, J. H. 2009. "Taking Property Rights Seriously: The Case of Climate Change." *Social Philosophy and Policy* 26 (2): 296–316.
- Aligica, P. D., P. J. Boettke, and V. Tarko. 2019. *Public Governance and the Classical-Liberal Perspective: Political Economy Foundations*. New York: Oxford University Press.
- Almudi, I., F. Fatas-Villafranca, L. R. Izquierdo, and J. Potts. 2017. "The Economics of Utopia: A Co-Evolutionary Model of Ideas, Citizenship and Socio-Political Change." *Journal of Evolutionary Economics* 27 (4): 629–62.
- Anderson, S. E., T. L. Anderson, A. C. Hill, M. E. Kahn, H. Kunreuther, G. D. Libecap, H. Mantripragada, P. Mérel, A. J. Plantinga, and V. K. Smith. 2019. "The Critical Role of Markets in Climate Change Adaptation." *Climate Change Economics* 10 (1): 1–17.
- Australian Productivity Commission (PC). 2012. *Barriers to Effective Climate Change Adaptation*. Inquiry Report No. 59. Canberra: PC.
- Brennan, G. 2009. "Climate Change: A Rational Choice Politics View." *Australian Journal of Agricultural and Resource Economics* 53 (3): 309–26.
- Brennan, G. and J. M. Buchanan. 2000 [1985]. *The Reason of Rules: Constitutional Political Economy*. Indianapolis: Liberty Fund.
- Buchanan, J. M. 2003. "Public Choice: Politics Without Romance." *Policy* 19 (3): 13–18.
- Cantner, U. and S. Vannuccini. 2018. "Elements of a Schumpeterian Catalytic Research and Innovation Policy." *Industrial and Corporate Change* 27 (5): 833–50.
- Coase, R. H. 1960. "The Problem of Social Cost." *Journal of Law and Economics* 3: 1–44.
- Colander, D. and R. Kupers. 2014. *Complexity and the Art of Public Policy: Solving Society's Problems from the Bottom Up*. Princeton: Princeton University Press.
- Cole, D. H. 2015. "Advantages of a Polycentric Approach to Climate Change Policy." *Nature Climate Change* 5: 114–18.
- Cordato, R. E. 1999. *Global Warming, Kyoto, and Tradeable Emissions Permits: The Myth of Efficient Central Planning*. Institute for Research on the Economics of Taxation. Accessed October 8, 2019. <http://iret.org/pub/SCRE-1.PDF>.
- Cordato, R. E. 2004. "Toward an Austrian Theory of Environmental Economics." *Quarterly Journal of Austrian Economics* 7 (1): 3–16.
- Dawson, G. 2011. "Free Markets, Property Rights and Climate Change: How to Privatize Climate Policy." *Libertarian Papers* 3 (Art. 10): 1–29.
- Dawson, G. 2013. "Austrian Economics and Climate Change." *Review of Austrian Economics* 26 (2): 183–206.
- Deneen, P. J. 2018. *Why Liberalism Failed*. New Haven: Yale University Press.

- DiZerega, G. 1996. "Deep Ecology and Liberalism: The Greener Implications of Evolutionary Liberal Theory." *The Review of Politics* 58 (4): 699–734.
- DiZerega, G. 2018. "Connecting the Dots: Hayek, Darwin, and Ecology." *Cosmos + Taxis* 5 (3–4): 51–62.
- Dockrill, P. 2019. "It's Official: Atmospheric CO2 Just Exceeded 415 ppm for The First Time in Human History." *Science Alert*, May 13, 2019. Accessed October 10, 2019. <https://www.sciencealert.com/it-s-official-atmospheric-co2-just-exceeded-415-ppm-for-first-time-in-human-history>.
- Dolan, E. 2016. *How Liberals and Conservatives Can Have a Constructive Dialog about Climate Change*. Accessed October 10, 2019. <https://www.slideshare.net/dolaneconslide/how-to-talk-to-conservatives-about-climate-change>.
- Driesen, D. M. 2019. "Toward a Populist Political Economy of Climate Disruption." *Environmental Law* 49 (2): 379–406.
- Dryzek, J. S., R. B. Norgaard, and D. Schlosberg. 2011. "Climate Change and Society: Approaches and Responses." In *The Oxford Handbook of Climate Change and Society*, edited by J. S. Dryzek, R. B. Norgaard, and D. Schlosberg, 3–17. New York: Oxford University Press.
- Emanuel, K. A. 2016. *Climate Science and Climate Risk: A Primer*. Accessed October 10, 2019. [ftp://texmex.mit.edu/pub/emanuel/PAPERS/Climate\\_Primer.pdf](ftp://texmex.mit.edu/pub/emanuel/PAPERS/Climate_Primer.pdf).
- Eucken, W. 2004 [1952]. *Grundsätze der Wirtschaftspolitik*. Tübingen: Mohr Siebeck.
- Faber, M. and R. Winkler. 2006. "Heterogeneity and Time: From Austrian Capital Theory to Ecological Economics." *American Journal of Economics and Sociology* 65 (3): 803–26.
- Fatas-Villafranca, F., C. M. Fernández-Márquez, and F. J. Vázquez. 2019. "Consumer Social Learning and Industrial Dynamics." *Economics of Innovation and New Technology* 28 (2): 119–41.
- Furton, G. and A. Martin. 2019. "Beyond Market Failure and Government Failure." *Public Choice* 178 (1–2): 197–216.
- Ganguly, G., J. Setzer, and V. Heyvaert. 2018. "If at First You Don't Succeed: Suing Corporations for Climate Change." *Oxford Journal of Legal Studies* 38 (4): 841–68.
- Geruso, M. and D. Spears. 2018. "Heat, Humidity, and Infant Mortality in the Developing World." *National Bureau of Economic Research Working Paper* No. 24870. Accessed October 10, 2019. <https://www.nber.org/papers/w24870>.
- Goldschmidt, N., E. Grimmer-Solem, and J. Zweynert. 2016. "On the Purpose and Aims of the Journal of Contextual Economics." *Schmollers Jahrbuch – Journal of Contextual Economics* 136 (1): 1–14.
- Hayek, F. A. 2007 [1944]. *The Road to Serfdom*. Chicago: University of Chicago Press.
- Hayek, F. A. 2006 [1960]. *The Constitution of Liberty*. London: Routledge.
- Heath, J. 2016. *Caring about Climate Change Implies Caring about Economic Growth*. Draft manuscript. Accessed 10 October 2019. [https://www.academia.edu/30297311/Caring\\_about\\_climate\\_change\\_implies\\_caring\\_about\\_economic\\_growth](https://www.academia.edu/30297311/Caring_about_climate_change_implies_caring_about_economic_growth).

- Hebert, D. and R. E. Wagner. 2013. "Taxation as a Quasi-Market Process: Explanation, Exhortation, and the Choice of Analytical Windows." *Journal of Public Finance and Public Choice* 31 (1–3): 163–77.
- Helm, D. 2008. "Climate-Change Policy: Why has so Little been Achieved?" *Oxford Review of Economic Policy* 24 (2): 211–38.
- Hill, P. J. 1992. "Environmental Problems under Socialism." *Cato Journal* 12 (2): 321–35.
- Horowitz, J. K. 2009. "The Income-Temperature Relationship in a Cross-Section of Countries and its Implications for Predicting the Effects of Global Warming." *Environmental and Resource Economics* 44 (4): 475–93.
- Humphreys, J. 2007. "Exploring a Carbon Tax for Australia." *Centre for Independent Studies (CIS) Policy Monograph* No. 80. St. Leonards: CIS.
- Iacobuta, G., N. K. Dubash, P. Upadhyaya, M. Deribe, and N. Höhne. 2018. "National Climate Change Mitigation Legislation, Strategy and Targets: A Global Update." *Climate Policy* 18 (9): 1114–32.
- Intergovernmental Panel on Climate Change (IPCC). 2014. *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Geneva: IPCC.
- Intergovernmental Panel on Climate Change (IPCC). 2018. *Global Warming of 1.5 °C. An IPCC Special Report on the Impacts of Global Warming of 1.5 °C above Pre-Industrial Levels and Related Global Greenhouse Gas Emission Pathways, in the Context of Strengthening the Global Response to the Threat of Climate Change, Sustainable Development, and Efforts to Eradicate Poverty*. Geneva: IPCC.
- Jordan, A., D. Huitema, H. van Asselt, and J. Forster. 2018. *Governing Climate Change: Polycentricity in Action?* Cambridge: Cambridge University Press.
- Keohane, R. O. and D. G. Victor. 2015. "After the Failure of Top-Down Mandates: The Role of Experimental Governance in Climate Change Policy." In *Towards a Workable and Effective Climate Regime*, edited by S. Barrett, C. Carraro and J. de Melo, 201–12. London: CEPR Press.
- Kiesling, L. 2010. "The Knowledge Problem, Learning, and Regulation: How Regulation Affects Technological Change in the Electric Power Industry." *Studies in Emergent Order* 3: 149–71.
- Kiesling, L. 2012. "Regulation's Effect on Experimentation in Retail Electricity Markets." *Annual Proceedings of the Wealth and Well-Being of Nations* 9: 89–113.
- Kolev, S. 2019. "James Buchanan and the 'New Economics of Order' Research Program." In *James M. Buchanan: A Theorist of Political Economy and Social Philosophy*, edited by R. E. Wagner, 85–108. London: Palgrave Macmillan.
- Lamey, A. 2015. "Ecosystems as Spontaneous Orders." *Critical Review* 27 (1): 64–88.
- Le Treut, H., R. Somerville, U. Cubasch, Y. Ding, C. Mauritzen, A. Mokssit, T. Peterson, and M. Prather. 2007. "Historical Overview of Climate Change." In *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, edited by Intergovernmental Panel on Climate Change (IPCC), 93–127. Cambridge: Cambridge University Press.

- Marron, D. B. 2015. "Bigger, Cleaner, and More Efficient: A Carbon-Corporate Tax Swap." In *Reviving Economic Growth: Policy Proposals from 51 Leading Experts*, edited by B. Lindsey, 189–92. Washington DC: Cato Institute.
- Masters, W. A. and M. S. McMillan. 2001. "Climate and Scale in Economic Growth." *Journal of Economic Growth* 6 (3): 167–86.
- Mayrhofer, J. P. and J. Gupta. 2016. "The Science and Politics of Co-Benefits in Climate Policy." *Environmental Science & Policy* 57: 22–30.
- McChesney, F. S. 1997. *Money for Nothing: Politicians, Rent Extraction, and Political Extortion*. Cambridge: Harvard University Press.
- Mendelsohn, R. 2006. "The Role of Markets and Governments in Helping Society Adapt to a Changing Climate." *Climate Change* 78 (1): 203–15.
- Nader, R. 2014. *Unstoppable: The Emerging Left-Right Alliance to Dismantle the Corporate State*. New York: Nation Books.
- National Oceanic and Atmospheric Administration (NOAA Research). 2013. "CO<sub>2</sub> at NOAA's Mauna Loa Observatory Reaches new Milestone: Tops 400 ppm." Earth System Research Laboratory – Global Monitoring Division. Accessed October 10, 2019. <https://www.esrl.noaa.gov/gmd/news/7074.html>.
- Nentjes, A. 2005. "Austrian Views on Environmental Protection." In *Modern Applications of Austrian Thought*, edited by J. G. Backhaus, 347–70. London: Routledge.
- New Zealand Productivity Commission (NZPC). 2018. *Low-Emissions Economy*. Final Report. Wellington: NZPC.
- Nordhaus, W. 2015. "Climate Clubs: Overcoming Free-Riding in International Climate Policy." *American Economic Review* 105 (4): 1339–70.
- O'Neill, J. 2012. "Austrian Economics and the Limits of Markets." *Cambridge Journal of Economics* 36 (5): 1073–90.
- Organisation for Economic Co-Operation and Development (OECD). 1994. *Regulatory Co-Operation for an Interdependent World*. Paris: OECD.
- Ostrom, E. 2005. *Understanding Institutional Diversity*. Princeton: Princeton University Press.
- Ostrom, E. 2009. "A Polycentric Approach for Coping with Climate Change." *World Bank Policy Research Working Paper* No. 5095. Washington: World Bank.
- Ostrom, E. 2012a. "Green from the Grassroots." Accessed October 9, 2019. <https://www.commondreams.org/views/2012/06/12/green-grassroots>.
- Ostrom, E. 2012b. "Nested Externalities and Polycentric Institutions: Must We Wait for Global Solutions to Climate Change before Taking Actions at Other Scales?" *Economic Theory* 49 (2): 353–69.
- Pennington, M. 2011. *Robust Political Economy: Classical Liberalism and the Future of Public Policy*. Cheltenham: Edward Elgar.
- Persson, J., A. Hornborg, L. Olsson, and H. Thorén. 2018. "Toward an Alternative Dialogue Between the Social and Natural Sciences." *Ecology and Society* 23 (4): 1–11.
- Pigou, A. C. 1932 [1920]. *The Economics of Welfare*. London: Macmillan.

- Potts, J. 2010. "Innovation by Elimination: A Proposal for Negative Policy Experiments in the Public Sector." *Innovation: Management Policy & Practice* 12 (2): 238–48.
- Potts, J., J. Foster, and A. Straton. 2010. "An Entrepreneurial Model of Economic and Environmental Co-Evolution." *Ecological Economics* 70 (2): 375–83.
- Quiggin, J. 2019. *Economics in Two Lessons: Why Markets Work So Well, and Why They Can Fail So Badly*. Princeton: Princeton University Press.
- Regan, S. E. 2015. "Austrian Ecology: Reconciling Dynamic Economics and Ecology." *Journal of Law, Economics & Policy* 11 (2): 203–28.
- Reinhoudt, J. and S. Audier. 2018. *The Walter Lippmann Colloquium: The Birth of Neoliberalism*. London: Palgrave Macmillan.
- Schmidtz, D. 2000. "Natural Enemies: An Anatomy of Environmental Conflict." *Environmental Ethics* 22 (4): 397–408.
- Setzer, J. and R. Byrnes. 2019. *Global Trends in Climate Change Litigation: 2019 Snapshot*. Grantham Research Institute on Climate Change and the Environment and Centre for Climate Change Economics and Policy, London School of Economics and Political Science. Accessed 9 January 2020. [http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2019/07/GRI\\_Global-trends-in-climate-change-litigation-2019-snapshot-2.pdf](http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2019/07/GRI_Global-trends-in-climate-change-litigation-2019-snapshot-2.pdf).
- Shahar, D. C. 2016. "Turning Adversaries into Allies: Conciliation in Environmental Politics." In *Interdisciplinary Handbooks in Philosophy: Environmental Ethics*, edited by D. Schmidtz, 243–68. Farmington Hills: Macmillan.
- Shahar, D. C. 2017. "Hayek's Legacy for Environmental Political Economy." In *Interdisciplinary Studies of the Market Order*, edited by P. J. Boettke, C. J. Coyne, and V. H. Storr, 87–109. London: Rowman & Littlefield.
- Skovgaard, K. and H. van Asselt. 2019. "The Politics of Fossil Fuel Subsidies and their Reform: Implications for Climate Change Mitigation." *WIREs Climate Change* 10 (4): 1–12.
- Stavins, R. N. 2015. "What Can an Economist Possibly Have to Say About Climate Change?" *Annual Proceedings of the Wealth and Well-Being of Nations* 7: 21–48.
- Stigler, G. J. 1971. "The Theory of Economic Regulation." *Bell Journal of Economics and Management Science* 2 (1): 3–21.
- Streissler, E. W. 1990. "Carl Menger on Economic Policy: The Lectures to Crown Prince Rudolf." *History of Political Economy* 22 (Annual Supplement): 107–29.
- Thierer, A. 2016. *Permissionless Innovation: The Continuing Case for Comprehensive Technological Freedom*. Arlington: Mercatus Center at George Mason University.
- Tullock, G. 1967. "The Welfare Costs of Tariffs, Monopolies, and Theft." *Western Economic Journal* 5 (3): 224–32.
- Turnheim, B., P. Kivimaa, and F. Berkhout. 2018. *Innovating Climate Governance: Moving Beyond Experiments*. Cambridge: Cambridge University Press.
- van Asselt, H., D. Huitema, and A. Jordan. 2018. "Global Climate Governance after Paris: Setting the Stage for Experimentation?" In *Innovating Climate Governance: Moving Beyond Experiments*, edited by B. Turnheim, P. Kivimaa, and F. Berkhout, 27–46. Cambridge: Cambridge University Press.

- Wagner, R. E. 2016. *Politics as a Peculiar Business: Insights from a Theory of Entangled Political Economy*. Cheltenham: Edward Elgar.
- Wagner, R. E. 2019. "Governance within a System of Entangled Political Economy." *Forest Policy and Economics* 107: 1–7.
- Walls, H. L. 2018. "Wicked Problems and a 'Wicked' Solution." *Globalization and Health* 14 (Art. 34): 1–3.
- Wehner, M., F. Castillo, and D. Stone. 2017. "The Impact of Moisture and Temperature on Human Health in Heat Waves." *Oxford Research Encyclopedias: Natural Hazard Science*. Accessed October 10, 2019. <https://oxfordre.com/naturalthazardscience/view/10.1093/acrefore/9780199389407.001.0001/acrefore-9780199389407-e-58>.
- Weitzman, M. L. 2011. "Fat-Tailed Uncertainty in the Economics of Catastrophic Climate Change." *Review of Environmental Economics and Policy* 5 (2): 275–92.
- Yu, T. F-L. 2011. *New Perspectives on Economic Development: A Human Agency Approach*. Wageningen: Wageningen Academic Publishers.