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Guest editorial

Theorizing the carbon economy: introduction to the special issue

The term 'carbon economy' often has an adjective placed nearby: the 'new' carbon economy, the 'low' carbon economy, the carbon 'neutral' economy, the 'zero' carbon economy, or can be simply thought of as the shorthand for the political economy of carbon. Such a discursive move marks a shift in focus from 20th-century carbon-based industry and society to aspirational movements in the new millennium. Brown and Corbera have focused on the novel directions in the 'new' carbon economy in describing it as one that "represents the emerging trade in carbon emissions, along with the series of market-based policy instruments designed to reduce global greenhouse gas (GHG) emissions through the creation of markets for carbon such as the flexibility mechanisms of the Kyoto Protocol" (2003, page 41). Through a variety of economic, political, ecological, and cultural twists and turns, new actors are stepping in to take advantage of these mechanisms and broker deals in 'voluntary' carbon reductions. Castree (2006) has cautioned that there are many dimensions to this emerging (new/low/zero) 'carbon economy' rather than a shift denoting an overarching organizing force.

The carbon economy essentially and *necessarily* props up and connects the workings of our everyday lives to the national and global-level political economic architectures organizing contemporary human societies. The industrial revolutions of the 18th and 19th centuries produced carbon-based industry initiatives that now intervene in just about all aspects of human life, from energy generation for household activities and the ways to get from place to place, to the conduct of businesses and the ways humans grow and consume food. Concurrently, detection and attribution research has found that these carbon-based practices have contributed to anthropogenic climate change (Allen et al, 2000; Karl and Trenberth, 2003; Tett et al 1999), thus opening a new moment in time some have called 'the Anthropocene Era' (Crutzen, 2002). In other words, carbon-based activities dominate economies and societies in ways not seen before in human history. Ironically perhaps, it is this carbon economy "intertwining evolution with the Earth's inanimate forces, air, sea, rock—and human infrastructure" that also threatens the very industries and societies it has enabled (Roston, 2008, page 1). Woven into these developments are the critical decisions made at the human – environment interface, referred to by Dalby as 'Anthropocene geopolitics' (2007).

Bailey (2007) and Bumpus and Liverman (2008) have also pointed out that the emerging institutions and spaces of carbon reductions—from flexible mechanisms (Clean Development Mechanism, Joint Implementation, International Emissions Trading) in the compliance market, to carbon offsets in the voluntary market—contribute to a range of possible and hotly contested futures in the carbon economy. From the pivot of market-based measures, there are competing visions of what architectures and institutions in the 'carbon economy' can look like. For instance, the legitimacy of the UN Framework Convention on Climate Change process (from which the Kyoto Protocol and its compliance market strategies was developed) has been challenged by way of the market-based Asia-Pacific Partnership on Clean Development and Climate (AP6), announced in 2005 by China, India, USA, Japan, Australia, and South Korea (Barnett, 2007). An AP6 'Partnership' actually does not set binding emissions targets (to be achieved through flexible mechanisms or otherwise) but rather pushes for advances

in the deployment of carbon capture and storage and nuclear technologies. These dimensions—and surface-level to deeper ideological contestations therein—make the mapping of the 'carbon economy' a complex and challenging set of issues to work through in light of prospects for increasingly dangerous climate change (International Alliance of Research Universities, 2009; Schellnhuber et al, 2006).

Recent work to reframe concepts like 'global warming' as 'our deteriorating atmosphere' and 'cap and trade' as 'cap and cash back' or 'pollution reduction fund' seek to build public support and acceptance of market-based GHG-reduction initiatives (Broder, 2009). Intermingled with these developments are the increasingly dominant (yet also increasingly 'normalized') market-based, privatized, individualized choices for measures to grapple with contemporary climate challenges. Through these processes, Newell and Paterson (2009) have pointed out that governance by the state has stagnated, while nonstate business and financial players "have become central actors in the construction and management of an elaborate and increasingly intermeshed system of climate governance." Those of an ecological modernist persuasion have argued that the increasingly congested spaces of market-based initiatives offer ways for capitalist profit and green behaviour to be usefully combined and balanced in the 'carbon economy'. Others, from a more Marxist perspective, have posited that neoliberal approaches have given rise to a particular way of governing undesirable climate consequences that produces regressive environmental, political, and social outcomes (Bakker and Bridge, 2006; McCarthy and Prudham, 2004). Others find shortcomings with critiques of neoliberal approaches writ large, and consider more suitably textured explanations. For example, Barnett argues, "stories about 'neoliberalism' pay little attention to the pro-active role of socio-cultural processes in provoking change in modes of governance, policy and regulation" (2005, page 10) and calls for more nuanced understandings of difference and collective action through Foucault's notions of 'governmentality' (see also Oels, 2005; Rutherford, 2007). Overall, the competing explanatory value of each of these theoretical perspectives remains open to ongoing considerations; thus, such explorations are pursued in a variety of forms and foci in this theme issue.

Authors in this theme issue have brought a range of theoretical tools to bear in attempts to understand, interpret, and productively critique contemporary constellations of interests surrounding carbon economies. These papers have emerged mainly from a set of sessions on "Theorizing the Carbon Economy" at the 2007 Association of American Geographers meeting, in San Francisco, California. In addition to the participants who have authored articles in this issue, participants also included Kathleen MacAfee (San Francisco State University), April Luginbuhl Mather (The Ohio State University), Michael K Goodman (Kings College London), and we four authors of this introduction. Session contributions pursued a set of associated questions which included: how has this carbon economy been constructed? What are the major discourses, economics, and politics that support it? How is it (dis)connected with the scientific debates on climate change? These are some of the questions further developed and elucidated in the papers of this *Environment and Planning A* theme issue.

It remains an ongoing and vital question whether the emergent carbon economies represent new arenas for applying social science theoretical approaches, whether they open up spaces for novel theoretical ideas, or whether carbon is just one more element subject to commodification, enclosure, and control of natural resources and environmental services. Regardless, the evolution of carbon economies in the future—whether through formal markets, carbon certification and advertising, local carbon reduction schemes, etc—will offer many research opportunities to explore these activities in ways that are theoretically engaged, whilst being practically useful. In addition, thinking

about carbon is becoming further engrained in cultural and social behaviour, where politically correct (PC) behaviour has given way to climate correct (CC) actions. Questions are ongoing as to whether these are mere movements of fashion and fad, or if they signal fundamental shifts in human–environment relations. In other words, these remain open queries as to how the new carbon economy may result in significant emission reductions—be it by *keeping* carbon out (preventing emissions) or *taking* carbon out (sequestering emissions) of the atmosphere.

Liverman (2008) and Damro and Mendez (2003) have highlighted the fact that carbon markets were originally a US proposal that was subsequently adopted by the EU as the policy driver for climate change even when the US failed to ratify the Kyoto agreement. When we speak of carbon economies today it is important to remember that these were not envisaged solely in market-based terms in early climate change discussions. Tax-based systems were also proposed, as was direct governmental action in developing renewable energies and regulating emissions. Indeed, climate change has rapidly become a neoliberal opportunity rather than a perceived threat or cost to the system. The mantra of lowest cost or most cost-efficient climate 'stabilization' dates from the early discussions and research on climate change policy (formalized or speculative) [eg as expressed in Lovins and Lovins (1991)]. If, as some suggest, Kyoto has been largely stalled in effectiveness and possibly redundant barring its symbolic intent at dealing with climate change (Prins and Rayner, 2007), then proposals to further develop the Kyoto-esque proposals need careful scrutiny if they are likely to achieve more emissions reductions and political traction in the future. Gareau and DuPuis's (2009) paper is an important contribution in tracing the genealogies of Kyoto and, drawing on the methyl bromide phase-out as a parallel example, they suggest there are many important historical parallels to be drawn in appreciating the Kyoto Protocol and its possible successors.

The papers in this issue also point to the fact that carbon economies are not simply constrained within formalized carbon markets; thus our theorization must also extend 'beyond-compliance'. Yamane (2009), for example, highlights the way in which the lure of carbon finance leads to anticipatory restructuring of other industries or livelihoods in ways that enhance access to carbon funds. In other words, economies may be restructured much more deeply than a focus on the formal carbon markets might envisage. Work on carbon offsets and the clean development mechanism (Boyd, 2009; Lovell et al, 2009) also illustrates the potential opportunities and dangers of carbon finance for local people and local economies. Combined with previous work on these topics (eg Bachram, 2004; Bumpus and Liverman, 2008; Lohmann, 2005; 2006) these accounts highlight the economic disparities, politics, and geographies of carbon-offset production and consumption.

Similarly Powells (2009) suggests that the processes within carbon markets may overflow and have unpredictable effects on a variety of other political and economic issues such as emissions trading and energy-efficiency commitments on the fuel poor in the UK. Thus we understand the emergence and outcomes of the carbon economies to extend far beyond the formal carbon markets. They suggest a reorganization of economic principles to take into account carbon emissions from the product life-cycle, consumer behaviours, or those sequestered in a forest used as an offset. In the same way that accountancy or auditing practices more generally influence vast sets of economic activity, so, now, does carbon accounting.

Companies have not only been responding to regulation of carbon emissions, but have been actively marketing themselves on their climate change actions. From BP to British Gas, companies have advertised their carbon emissions turning carbon neutrality into a marketing ploy to attract climate-conscious consumers, directly making

climate change management a profitable activity (de Goede and Randalls, forthcoming; Liverman, 2008). A 2008 UN study found that GHG emissions from forty industrialized nations that signed the Kyoto Protocol actually collectively increased 2.3% in the first six years of the new millennium (Schmitt-Roschmann, 2009). Indeed for Luke (2008) these activities represent another iteration of 'green consumption' in which the underlying issues around consumption are not challenged, just made greener, whilst corporate profits continue to grow. He has argued that market-based activities become more entrenched and 'naturalized' within the bounds of neoliberal projects (Harvey, 2005; Luke, 2008). Here the marketplace is an end rather than a means to other ends of 'sustainability' and 'environmental protection'.

In the early years of the EU ETS (Emissions Trading Scheme) *The Economist* (2007) magazine reported that (citing Guy Turner) "The root of the problem ... is that many companies view the ETS as a regulatory burden, rather than a chance to make money." At the same time, as Kanter (2008) highlighted, companies made significant profits from the first round of the EU ETS. If this was combined with significant emissions reductions it might provide some proof for the ecological modernist argument. Indeed as Bailey and Wilson (2009) suggest, these approaches have relied upon technological and 'win – win' optimism that has been insufficiently demonstrated thus far. As they go on to suggest, the problem may not be carbon markets as such, but the ways in which they might become exclusive policies to the detriment of a rather broader set of regulations to tackle climate change. Their use of transitions theory to understand the emergence of carbon economies provides an important insight into the systemic ideologies and counterideologies that underpin the rationales, policies, and attitudes towards carbon trading: an important point for opening up future, alternative configurations.

Understanding the workings of carbon markets is critical to appreciate the ways in which they offer continuities and ruptures with present economic systems. MacKenzie (2007), for example, points to the complex politics of carbon trading and suggests an engagement with thinking through precisely how carbon markets work to better understand their consequences. Powells (2009) draws usefully on poststructural insights to extensively detail the complexities, and reconfigurations, of fuel poverty through an analysis of the UK's energy efficiency commitment and broader climate policy. Through notions of entanglement and disentanglement, Powells builds a networked understanding of the sinews and (over)flows that connect the EU ETS and UK domestic reductions in unforeseen ways. By detailing these 'overflows' between the broader carbon economy and national policies, market externalities are repressed and then reconfigured, recreating socioenvironmental problems of fuel poverty and double-counted carbon emissions. Powells' study illustrates how such approaches can help us understand the wider difficulties of using 'simple' market mechanisms to control complex socionatural systems, and, specifically, their effects on ordering emerging carbon economies through assemblages of technoscientific actants with material outcomes.

By contrast, the more structural critique of neoliberalism in Gareau and DuPuis's paper (2009) offers a more normative view point on the efficacy of carbon markets as tools to govern climate change mitigation. Drawing on their work on the Montreal Protocol, and the continued use of methyl bromide, they show how global environmental governance represents more than just a shift from 'command-and-control' to 'market-based' solutions. Instead, they note the political and environmental problems associated with the transition from public to private knowledges that legitimize private interests in the governance of global environmental concerns. Couched within the broader tendency toward neoliberal approaches to environmental governance, their

paper serves to illustrate the multilevel tensions in global environmental policy, and its local political manifestations; a key frame of analysis in the growth of the carbon economy's project-based mechanisms (Bumpus and Liverman, 2008).

Overall, there is a pervasive character to this 'carbon economy', where market-based, privatized, and technologically focused initiatives have seemingly been 'naturalized'. These movements have emerged discursively as well as materially. The papers in this issue raise both theoretical and policy questions about the rapidly changing landscape of climate and energy policy and the emergence of carbon markets. We believe that this is a rich and exciting area for future research where the tools of social theory, critical fieldwork, and policy analysis have much to offer.

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