

**FOSSIL FUEL, CAPITALISM, AND THE STATE: A CRITICAL APPROACH
TO THE INTERNATIONAL CLIMATE CHANGE DISCOURSE**

by

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Abstract

This paper offers a structural critique of the international climate change discourse and challenges the coherency of the norms and logic that underpin the Kyoto Protocol. The first section outlines how the dominant climate discourse in the international community presents the economic imperatives of the state as compatible with the objective of reducing greenhouse gas emissions. The second section argues that in operating to facilitate global economic growth and to sustain the conditions for capital accumulation, the dominant climate discourse in fact *precludes* states from achieving the emission reductions that are necessary to avert pending and dangerous climactic changes. The argument builds off of the critical treatment of three interconnected facets of the global capitalist system that, it is argued, have caused a metabolic rift to form in the global carbon cycle: (1) the historically specific role of carbon-emitting fossil fuel in the development of capitalism's constitutive production and circulation processes, what Huber (2009) calls capitalism's 'fossil fuel mode of production'; (2) capitalism's inherent expansionary drive; and (3) the compromised relationship of the state with capital.

When combined, these insights suggest that meaningfully reducing greenhouse gas emissions requires the development of a radically different climate discourse, one that fundamentally transforms the structure of the current capitalist system, including, importantly, the imperatives of the modern capitalist state. The paper concludes by offering a sketch of what a postcapitalist state would look like emphasizing the necessary role that it could play to promote strategies of ecological modernisation that foster the development of an alternative energy mode of production. This state would regulate and

even proscribe certain destructive tendencies of capital accumulation in order to create economies that cease to threaten the integrity of the global carbon cycle.

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1 Introduction

Though certainly not without its skeptics and detractors, there exists a strong consensus across the global scientific community that *anthropogenic* greenhouse gas (ghg) emissions are primarily responsible for observed climatic changes, namely observed increases in average global temperature (Oreskes, 2004 and IPCC, 2007). It is argued by the IPCC (intergovernmental panel on climate change), widely regarded as the most authoritative body on climate change science, that reducing the concentration of the most abundant ghg in the atmosphere emitted due to human activity, CO₂, is paramount to any serious attempt to mitigate this warming trend.¹ According to the fourth assessment report of the IPCC, concentrations of CO₂ in the atmosphere have increased by a staggering 36% since approximately 1750, the end of the pre-industrial era (IPCC, 2007). CO₂ emissions have grown between 1970 and 2004 by about 80% (a worrisome 28% between 1990 and 2004 alone) and they represented 77% of total anthropogenic ghg emissions in 2004 (IPCC, 2007). The largest growth in emissions came from the global energy supply sector which is heavily reliant on the burning of carbon-emitting fossil fuels. In the United States, for example, fossil fuel combustion accounted for 94.1 percent of the world's biggest economy's CO₂ emissions in 2008 (EPA, 2008).

In order to stabilize atmospheric concentrations of CO₂ at between 445 and 490ppm² (a measure that would still result in an estimate global temperature increase of 2 to 2.4°C above the pre-industrial average, and a level at which it is predicted that the most dangerous consequences of climate change can yet be averted) global ghg emissions need to peak before 2015, and emission reductions of between 50 to 85% below 2000 emission

¹ The IPCC's response to challenges to its methods, evidence and the conclusions of its most recent report, is available online at, <http://www.ipcc.ch>.

² Ppm refers to parts per million.

levels are needed by 2050 (IPCC, 2007). The need to reduce global reliance on fossilized energy, and with haste, is abundantly clear.

In December, 2009, at the 15th conference of parties (COP 15) to the United Nations Framework Convention on Climate Change (FCCC), the international community did not reach agreement on a binding treaty to replace the existing international climate governance regime, the Kyoto Protocol signed in 1997 and due to expire in 2012.³ This failure left a profound sentiment of disillusion among many actors and observers in the international community, not only within the policy circles of the so-called ‘climate leaders’, the European Union, but also in the more mainstream environmental movement. Influential environmental-non governmental organizations (NGOs) such as Greenpeace and the World Wildlife Fund (who together form the core of the influential umbrella group of over 450 NGOs, the Climate Action Network or CAN) pushed for industrialized states to negotiate a successor agreement at COP 15 that is based on the ‘Kyoto-track’ (Climate Action Network, 2009).⁴ In other words, they supported the negotiation of a post-2012 treaty which would build on the norms institutionalized in the Kyoto Protocol.⁵ While CAN did seek for states to commit to deep cuts in global ghg emissions (particularly from industrialized countries), what they and, indeed, what many states, private interests, and other key international actors assume(d) *uncritically* is that the norms that undergird the Kyoto Protocol are *capable* of

³ The “Copenhagen Accord”, an agreement that did emerge from COP15, and one that was signed by a host of key international actors including the United States and China, is a non-binding document and *is not* a part of the FCCC.

⁴ For CAN’s reactions to the progress (or lack thereof) at international climate negotiations including at COP 15 see the ECO newsletters posted at: <http://www.climatenetwork.org/>

⁵ Following Bernstein (2001, p.2), I understand “the importance of norms in policy to come from their *institutionalization*, which concerns the perceived legitimacy of the norm as embodied in law, institutions or public discourse, even if not all relevant actors follow it. As such, norms are central to all governance structures since governance ultimately concerns the steering of actors towards collective or shared goals and values.”

facilitating the reductions that the IPCC posits are necessary to avert dangerous levels of climate change.

In light of the current paralysis in the post-2012 international climate negotiations (and as global trends in ghg emissions continue along their upward growth trajectory) the need for serious and critical reflection upon the norms and logic that underpin the current international response seems more urgent than ever. Building on arguments drawn from the related fields of critical international political economy (IPE), historical materialism, and ecological Marxism, I develop such a critique in this paper. While I aim to analyze the strengths and weaknesses of the arguments that inform my critique when appropriate, I do not have space here to offer a systematic defense of them. Rather, I focus my efforts on drawing out their implications. In the spirit of critical theory's method of 'immanent critique', my principal intent is to uncover and expose the latent (and at times, blatant) relations of power that have structured the dominant climate discourse in particular ways.⁶ More pointedly, I want to draw attention to the destructive practices and arrangements promoted by this discourse, practices expressed most explicitly in the Kyoto Protocol. Finally, the method of immanent critique I employ in this paper leads me to theorize about the possible development of a new climate discourse, one that builds upon the critical reflections contained herein and one that has the potential to transcend the flaws that plague the existing order.

The central argument I develop in this paper is that the dominant climate discourse is plagued by a fundamental incoherency. On the one hand, it promotes aggregate growth in the global economy, encouraging states to pursue policies that secure

⁶ Henceforth, I will refer to the dominant international climate change discourse as simply 'the dominant climate discourse' for brevity's sake.

the conditions for ever expanding capital accumulation, while, on the other hand, it mandates them to reduce their ghg emissions.⁷ The discourse presents these dual economic and ecological objectives as compatible with and even complimentary to one another. It is my contention, however, that due to certain environmentally destructive tendencies immanent to current global capitalist system, sustaining the conditions for economic growth and continual capital accumulation in fact *precludes* the state from also achieving meaningful ghg emission reductions. My argument builds on an analysis of the historically specific relationship between carbon-emitting fossil fuel and the development of the growth-driven global capitalist system, with its constitutive energy-intensive production and circulation processes. I demonstrate that the dynamics of the current global capitalist system are responsible for creating what Brett Clark and Richard York (2005) refer to as a metabolic ‘rift’ or rupture in the global carbon cycle.

The implications of my argument in regards to the development of an international response that can realistically mitigate climate change are serious: ghg emission cuts at levels that avert dangerous climate change will only be achieved through a fundamental and systemic restructuring of capitalist economies and the imperatives of the modern capitalist state. Thus, I argue that mending the ‘rift’ in the carbon cycle requires the evolution of ‘postcapitalist’ states equipped with a regulatory mandate capable of upholding the ecological integrity of global ecosystems and that revolutionizes the technological bases of the productive forces of capitalism – the development of an alternative energy (i.e., non-fossil fuel) mode of production.

⁷ When I speak of the ‘state’ here, I am referring to the governing apparatus’s found similarly in most (although not all) modern polities, particularly in advanced capitalist countries. Importantly, if obviously, it is the state that posses the standing or recognition under international law that allows them to take part as a sovereign entity in international regimes such as the FCCC. I return to more explicit and detailed discussions of the state (and theories of the state) at several junctions in this paper.

1.1 Outlining the Argument

The argument proceeds in three parts: The first section focuses on explicating the central logic of the dominant climate discourse. Here, I build the case that the norms institutionalized in the Kyoto Protocol were formulated based on a convergence of environmental protection norms and norms associated with the imperatives of the neoliberal state in an age of competitive economic globalization. In the Kyoto Protocol, emission reductions were presented as being compatible with the maintenance and expansion of a global ‘liberal economic order.’ This convergence of objectives, which Steven Bernstein (2001) has labeled the ‘compromise of liberal environmentalism’, allowed climate change to rise to prominence on the international agenda. Yet this convergence of norms only holds in so far as the mechanisms that Kyoto created to facilitate reductions in ghg emissions corresponded with pre-existing ideas about the virtues of competition and the free market, and the necessity of facilitating conditions for increasing levels of capital accumulation and overall economic growth .

In the second section, my focus switches to exposing certain structural conditions (and contradictions) constitutive of the current global capitalist system that challenge the coherence of the dominant climate discourse. I demonstrate that the dangerous concentration of CO₂ emissions accumulating in the earth’s atmosphere can be understood through several interconnected features of the global capitalist system: (1) the historically specific role of fossilized energy –including the exploitation of its unique physical characteristics– in the expansion of industrial capitalist production and circulation, what Matthew Huber (2008) has labeled the ‘fossil-fuel mode of production’; (2) capitalism’s inherent expansionary tendency; and (3) the economic imperative of modern capitalist states and the consequent ‘compromised’ character of their relation to

capital which undermine its ability to successfully enact ghg reduction measures. Based on the combined power of these critical insights, I argue that it is the dynamic of the current global capitalist system itself that has caused the formation of an ‘irreparable’ metabolic rift in the carbon cycle. Because the norms which underpin the Kyoto Protocol are embedded in the driving logic of the current global capitalist economy, the dominant climate discourse can be understood to be operating to *reproduce*, rather than mitigate, those conditions that continue to exacerbate anthropogenic climate change.

In the third and concluding section of the paper, I consider the implications of my critique for moving forward international climate policy. I outline a vision of a new climate discourse, one that, if adopted, has the potential to transcend the contradictions that plague the existing discourse. I argue that the radical shift away from fossil fuels that is needed to reduce ghg emissions depends necessarily upon a simultaneous radical transformation to the character of capitalist economies and therefore to the structure of modern capitalist states. Here, I outline a vision of a discourse that recognizes the necessity of utilizing the state’s regulatory capabilities to do the following: (a) foster the development of new technologies, especially in relation to alternative energy; and (b) subordinate and even proscribe practices and arrangements associated with capital accumulation and economic growth that are damaging to the global carbon cycle or to the integrity of ecosystems more generally.

2 Understanding the Logic of the Dominant Climate Discourse

2.1 Introduction

International efforts to address climate change as embodied specifically in the Kyoto Protocol have been described by Matthew Paterson as “global governance for sustainable capitalism” (Paterson, 2009, p. 110). Paterson’s mocking ‘play’ on the term ‘sustainable development’ alludes to his critical identification of a central guiding logic that characterizes the Kyoto Protocol: Reductions in ghg emissions are capable of being achieved while keeping in tact the overall structural mechanics of the existing global capitalist system. According to this logic, emission reduction targets ought to be met not through a fundamental restructuring of capitalist economies or reorganization of production and consumption patterns, nor even through stricter command and control style state regulations; rather, reductions are to be achieved through the utilization of the technological innovation fostered first and foremost by the private sector in a competitive global economic marketplace. Kyoto promotes the pursuance of emission reductions through a combination of market-liberal economic policies and what Robyn Eckersley (2004) refers to as “weak” strategies of ecological modernisation. As I demonstrate below, the norms institutionalized in the Kyoto Protocol reflect the overriding view in the dominant discourse that emission reduction strategies are to be followed only in so far as they promote, or at the very least do not encumber, the state’s economic imperatives.

2.2 Sustainable Development and Ecological Modernisation

Bernstein (2001) documents a broad shift that occurred in the norms that guided global environmental governance regimes between the 1960s and the early 2000s. In the late 1960s and early 1970s, global responses to environmental problems focused much

more on the negative environmental consequences of unregulated industrial development and were suspicious of economic growth. This can be seen, for example, in *The Limits to Growth* report (Meadows et al., 1972) and in the positions adopted at the first United Nations Conference on the Human Environment held in Stockholm, both of which emphasized top down or state-led regulation as a means of arresting ecological degradation (Bernstein, 2001 and 2002). Bernstein argues that the 1980's saw a shift in the international community to a more diffuse "sustainable development" discourse, one that signaled the movement toward viewing economic growth and environmental protection as compatible objectives. This involved the abandonment of the more zero-sum 'growth vs. protection' positions characteristic of the previous decade.

Eckersley (2004, p .72) argues persuasively that it was the emergence of an 'ecological modernisation discourse' that played a central role in the acceptance of the dual objectives of sustainable development. Ecological modernisation is characterized by the ascendance of strategic environmental policy development premised on the belief that "economic and environmental considerations could be made to work synergistically" (Ibid.). At the core of this ecological modernisation discourse, Eckersley explains, lays the "notion that economic growth and environmental deterioration can be decoupled by pursuing greener growth rather than by slowing growth. By 'greener growth' it is usually meant economic growth that uses less energy and resources, produces less waste per unit of GDP, and seeks constant technological innovation in production methods and product design in ways that are less material-energy intensive" (Ibid, pp. 72-73). These strategies are predominantly supply-side. That is, they seek more environmentally efficient ways to continue to expand output. They do not challenge the commitment to an increasing

aggregate output of goods and services nor do they challenge the logic of the consumption and waste generation patterns associated with this output (Barry and Eckersley, 2005c, p. 262). So while the state may enact policies that enable or support ecological modernisation strategies in some capacity, “it is left to the private sector to develop, test, and market these new ecologically efficient innovations and production methods” (Barry and Eckersley, p. 260).

These “weak” ecological modernisation strategies place economics and the environment in a positive sum relationship (Hunold and Dryzek, 2005; Eckersley, 2004).⁸ From an economic perspective, that is, they offer a strategic claim: rather than pose as a threat to economic growth, “environmental criteria such as sustainability and the precautionary principle can make capitalist production more efficient and consequently profitable” (Ibid., p. 83). This approach to environmental policy operates according to the general assumptions of ‘environmental economics’, what can be understood as a subfield of neoclassical economics.⁹ Environmental economics views environmental problems such as resource degradation and pollution as the product of market failure. In other words, it views environmental problems as arising due to the insufficient accounting of or complete failure to *price* natural resources and negative externalities related to depletion and pollution. Environmental problems, in this view, are *correctable* through market-based instruments including taxes, user fees, tradable permit schemes and other types of market-based incentives. These mechanisms can be used to properly price

⁸ As will be discussed at length in the concluding section of this paper, Eckersley (2004), among others, distinguishes between weaker and stronger (more reflective) strategies of ecological modernisation.

⁹ For an informative discussion of the basic tenets of environmental economics in contrast with other approaches to the economy-environment nexus, see Clapp and Dauvergne (2005). For a more normative comparison, see Eckersley (2000).

resources, stimulating reductions in resource waste, more efficient resource use, and even the development of alternatives or replacement resources by private firms.

2.3 The ‘Competition State’ and the Compromise of (Liberal) Environmentalism

The sustainable development discourse achieved global prominence after the publication in 1987 of *The Brundtland Report*¹⁰ by the United Nations World Commission on Environment and Development (WCED). The language contained in the report reflects the shift to the strategic environmental policy approach characteristic of ecological modernisation. Bernstein (2002, p. 9) highlights that *The Brundtland Report* “begins with the imperative of economic growth, *and then* moves to the question about how to make it sustainable.”¹¹ By 1992, at the Rio Earth Summit, and more importantly in the subsequent formation of the FCCC, the definitive shift was cemented. This shift effectively institutionalized the position “that liberalization in trade and finance is consistent with and even necessary for international environmental protection, and that both are compatible with the overarching goal of sustained economic growth” (Bernstein, 2002, p.4). Bernstein adds that, in fact, “the FCCC as a whole, as explicitly stated in Article 4(2) (a and b) rests on the link between developed countries ‘modifying’ greenhouse gas emissions while recognizing *inter alia* ‘the need to maintain strong and sustainable economic growth’ ” (2002, p. 12). Bernstein refers to this newest incarnation of global environmental governance norms as the “compromise of liberal environmentalism” (Bernstein, 2001, 2002).

The norms of liberal environmentalism predicate international environmental protection on the promotion and maintenance of a global (neo)liberal economic order.

¹⁰ The report was also known as *Our Common Future*.

¹¹ My emphasis.

This “compromise” can be better understood in relation to the shift in the dominant understanding of the role and rationale of the modern capitalist state under the conditions of intensified economic globalization and the more general ascendancy of neoliberal ideology. Eckersley (2004, p. 65) explains that over the last three decades, social democracy and the welfare state have been replaced by the emergence of neoliberalism and what she calls ‘the competition state,’ “whose primary task is to make economic activities located within the territory of the state more competitive in global terms”. The rules of this new game sometimes referred to as ‘disciplinary neoliberalism’, require the modern capitalist state to pursue a range of ‘market-liberal’ measures that purportedly facilitate economic growth and “attract increasingly mobile capital” (Barry and Eckersley, 2005b, p.VII). This includes pursuing everything from reducing government spending to deregulating labour and financial markets in favour of market-based initiatives, privatizing state owned enterprises, dismantling protection and other trade restrictive measures, and enacting policies to control inflation (see Barry and Eckersley, 2005a; Clapp and Dauvergne, 2005).

Eckersley argues that the result of this has been “a shift away from the idea of the state as the protector and provider of public goods and services toward the notion of the state as the facilitator of privatization, commodification, marketization, and deregulation” (2004, p. 66). In the compromise of liberal environmentalism, then, environmental objectives (such as reducing ghg emissions) are absorbed into the state’s broader objective of pursuing policies that improve the competitive advantage of its firms in the global market.

2.4 The Kyoto Protocol and the Flexibility Mechanisms

According to Bernstein (2002, p.10,) there is “no better example of the effects of liberal environmentalism than the 1997 Kyoto Protocol”. The Kyoto Protocol links reductions in ghg emissions in developed countries to three policy instruments, which rely on market mechanisms (the so-called “flexibility mechanisms”), that involve transferring “credits” for emissions to help countries meet their reduction targets. These mechanisms are: (1) emission trading system; (2) joint implementation (JI); and (3) the clean development mechanism (CDM). Emissions trading is a mechanism whereby allowances to emit CO₂ are allocated within the limits of an overall ceiling or cap. Participants in the system are then allowed to trade the allowances amongst themselves (Mathews and Paterson, 2005, p. 63). The mechanism was included due to demands by important actors such as the United States who wanted a measure of flexibility in regard to meeting emission reductions. Emissions trading functions on the premise “that assigning property rights to emissions and creating a market that allows them to be transferred will enable emission reductions to be achieved where it is most efficient, or cheapest to do so” (Bernstein, 2002, p. 10). The mechanism essentially creates a new site where carbon, as a pollutant, is commodified. CO₂ allowances can be bought and sold for profit among actors creating a new business opportunity, a new site for capital accumulation for private actors in the global economy. Firms have an *economic* incentive to innovate or modernize by investing in new technologies or reforming their practices to improve their efficiency and stand to gain from other firms that fail to meet reductions.

The JI and CDM mechanisms create incentives for developed countries with emission reduction obligations to engage in and promote modernisation projects that lead

to ghg emission reductions in other states.¹² Emission reductions created in other states are then counted against the obligations of the developing state¹³. These projects are most often focused on the transfer of ‘green technologies’ which improve energy efficiency but again are also designed to promote opportunities for business through incentives for firms to enter new markets. The JI and CDM can be principally understood in terms of their “legitimation of market access for firms from the EU, North America, or Japan to countries in the South and in former Soviet bloc states, the ‘economies in transition’ (EIT)” (Mathews and Paterson, 2005, p. 66). Mathews and Paterson (2005, p. 67) argue that to date the JI and CDM have been driven by the interests of private actors (firms and corporations) seeking investment and market creation opportunities and by state managers seeking to facilitate such opportunities for their domestic firms. Their analysis supports the argument I am building. The three Kyoto mechanisms typify the guiding logic of the dominant climate discourse – a discourse informed by the compromise of liberal environmentalism. The Kyoto mechanisms have an obvious ‘fitness’ (to use Bernstein’s terminology) with the growth-driven, market-liberal orientation that has characterized the global environmental governance discourse more generally since the 1980s.

¹² While there is insufficient room here to describe these mechanisms in detail, Mathews and Paterson (2005, p.66) outline them in the following succinct manner: Joint implementation creates a set of incentives under Kyoto for Western states and EIT [Economies in Transition], both Annex I states under the (...) UN FCCC. Western states have an incentive to promote their companies’ overseas operations in EIT, and the EIT have a converse incentive to engage in projects with Western firms in order [for] both to gain access to particular technologies and to reduce their emissions further. Of course, the emissions of a number of EIT states have reduced dramatically since the collapse of the Soviet Union and its satellite states, which led to economic collapse. The CDM creates similar incentives in relation to developing states (non-Annex I states), although the latter have no formal obligations to reduce their emissions under Kyoto.”

¹³ Again, under the Kyoto Protocol only developed states or Annex 1 countries are obliged to reduce their ghg emissions. Developing states and EITs (Annex 2 and 3 countries) are not obliged to meet emission reduction commitments.

What I have attempted to outline thus far is an accurate picture of the logic and normative underpinnings of the dominant climate discourse, a discourse that found expression in the formation of the Kyoto Protocol and that continues to shape the trajectory of the post-2012 climate negotiations. The Kyoto mechanisms operate to achieve emission reductions while upholding the logic of the prevailing global neoliberal economic order. The Kyoto Protocol as a governance regime serves to facilitate particular forms of capitalist development and expansion. Reaching a viable solution to climate change (i.e. dramatically reducing ghg emissions) is left to the harnessing of green capitalist ventures and to modernisation strategies that aim either to improve the efficiency of existing energy sources or develop new and cleaner ones. As Scott Prudham has argued, the dominant climate discourse assumes “that the logic of the market and its profit-driven entrepreneurs auger well for green capitalism which will rise to the occasion and prove the compatibility of capital accumulation with environmental sustainability” (Prudham, 2008, p.1599). With so much at stake on this issue, this logic deserves close scrutiny.

3 A Critical Assessment of Capitalism: Facing up to Fossil Fuel

3.1 Introduction

Having outlined the norms that underpin the logic of the dominant climate discourse, I move now to a critique of certain structural dynamics of capitalism, ones that I contend problematize, and, indeed, *undermine* the very logic of this discourse. While there are certainly important and even complimentary insights to be found in other critical approaches, in the following analysis I demonstrate the necessity of examining the dominant climate discourse through a Marxian-inspired critical lens.¹⁴ I am concerned here specifically with the logic of the dual objectives promoted as complimentary by the discourse – that states can secure the conditions for economic growth and capital accumulation *and* reduce their ghg emissions. In this section, I build the case that the accumulation of anthropogenic CO₂ in the atmosphere, at levels which have caused what Clark and York (2005) describe as a ‘metabolic rift’ (or rupture) in the natural carbon cycle, emerged from the conditions and relations of global capitalist production and circulation.

I will elucidate this argument by providing a critical analysis of two interconnected facets of the global capitalist system: (1) fossil fuel’s internal and necessary role in the historical evolution of capitalism, what Huber (2009) refers to as capitalism’s fossil fuel mode of production; and (2) capitalism’s inherent (often indiscriminate) expansionary imperative. Further complicating moves to reduce ghg emissions is a third and final related dynamic – the structural relationship between the

¹⁴ My structurally-oriented critique is by no means the only critical approach that can and has been taken towards the climate change discourse. In fact, more post-structural and discursive approaches to climate governance have recently emerged focusing, for example, on such issues as the state’s role in the ‘territorialization’ of global carbon flows and on the construction of particular objects of knowledge (for example, ‘carbon sinks’ in the Kyoto Protocol. See Castro (2004) and Paterson and Stripple (2007).

modern capitalist state and the interests of capital generally. Through demonstrating that the climate crisis emerged from conditions immanent to the current structures of global capitalism, my analysis makes clear that the dominant climate discourse is fundamentally flawed and renders it evident that viable emission reduction strategies are not likely to come out of the modern capitalist state.

3.2 The Fossil Fuel Mode of Production

As outlined in the introduction, the exploitation of fossil fuel energy has played a crucial role in the growth of global CO₂ emissions linked to current climatic warming trends. There is an essential connection, moreover between the global growth in fossil fuel consumption and the historical emergence and development of the global (industrial) capitalist system over the past two and half odd centuries. It is no secret that fossil fuel energy has been indispensable to the growth of the global economy, but a careful exploration of the dynamics of this relationship and its implications for achieving reductions in ghgs is of particular importance in light to the current logic of the dominant climate discourse. To this end, Mathew Huber's (2009) historical materialist account of the immutable role that fossilized energy played in enabling -or more accurately, in *powering*- the productive forces of capitalism, as well as its role in the continued reproduction of capitalist social relations, is particularly instructive.

Huber's analysis underscores the importance of the monumental shift from solar or biological sources of energy (for example, muscles, wood, wind and water) to fossilized sources (first coal and later oil and gas) and how this shift fundamentally transformed the conditions and relations of production. The exploitation of the massively *more productive* properties of fossilized energy over muscle energy, he contends, led to

the transfer of the “core productive forces” of society from bodies to machinery – a critical shift that was essential to the onset of the industrial revolution (Ibid., p. 109).¹⁵ Consistent with a dialectical understanding of energy and social processes, Huber’s analysis also focuses on the importance that this shift in energy had on the relations of production. With the productive forces (machinery) able to be powered by fossil energy, the relations of production necessarily changed as the worker (wage laborer) became a less important physical productive force. “The emergence of large-scale fossilized production” Huber explains, “hastened the generalization and extension of the wage labor relationship on an expanded scale heretofore unseen” as concentrated spaces of production (i.e., factories) began to develop rapidly (2009, p. 110). With the discovery of fossilized energy sources, the operation of capitalist production (that is, of industrial machinery) became dependent on a constant supply of this energy to sustain its (constantly expanding) operations.

The historically specific relationship between fossil fuel energy and the development and evolution of industrial capitalism must be conceived of as a ‘fossil fuel mode of production.’ In other words, fossil fuel “internally powers the forces and relations of capitalist production” (Huber, 2009, p. 108). As I elaborate on further in the following section, it follows that the ‘mammoth productivity’ of capitalist production, and its concurrent massive generation of waste (as CO₂ emissions) can be traced to the exploitation of the productive power of fossilized energy (Huber, p. 110).

¹⁵ According to energy scientists coal has high energy density. Huber cites the work of Smil (1994, p.12), who argues that the energy density of dried wood, for example is 12-15 MJ/Kilogram compared to 28-32 for anthracite coal, and 40-44 for crude oil. The discovery of fossil fuels meant the discovery of a source of energy with the productive capacity to power industrial production like nothing before it.

3.3 Ever Expanding Growth: A Capitalist Ethos

At this point it is necessary to draw attention to the link between fossil fuel energy consumption and one of capitalism's more insidious tendencies: its expansionary drive. A central characteristic of capitalism, Marx observed, is the constant revolution of the technological bases of the productive forces, a relentless drive fuelled by the profit-motive and facilitated by continual reinvestment of accumulated capital for the sake of further accumulation (Marx, 1987). It works as a self-propelling process: the surplus profit accumulated at one stage becomes the investment fund for the next round of the accumulation of capital, which for all intents and purposes becomes an end in itself (Prudham, 2009). As Mathew Paterson (2000, p. 45) aptly describes:

The productive potential of capitalist social relations (wage labour) combined with the competition facing capitalists in the marketplace, and the technological dynamism produced by these two features, means that the capitalist economic system *requires growth in order to survive*. Perhaps the simplest expression of this is that within modern capitalist economies a lack of growth is *the* definition of a crisis (recession). Growth on the scale of the economy as a whole is the corollary of the need for firms in a competitive situation to maximise profits.¹⁶

Capitalism's basic productive drive "leads it to generate an ever-intensified throughput of resources" (Ibid, p.49). This has critical implications for the purposes of the specific argument here. The dynamic productivity (and profitability) of large-scale industry in a capitalist system necessitates the search for ever more raw materials (specifically, fossilized energy) as it seeks the constant expansion of markets for its products/goods that it chases "over the whole surface of the globe" (Marx, 1987, p.224).

¹⁶ My emphasis added. Essentially, this means that "if the system as a whole were unable to grow, then individual firms would eventually run out of profitable investments" (Paterson, 2000, p.46).

Now, the exploitation of fossilized energy also necessarily ensures the production of industrial waste – most notably, with respect to the climate crisis, CO₂ emissions. This factor creates clear complications for accepting the logic of the dominant climate discourse. Under the current conditions of capitalism, the promotion of policies that foster economic growth lead to the exploitation of carbon-emitting fossil fuels, and on an ever increasing scale. I will elaborate on this key point further below, but at this point the question begs, why it is that *fossil fuel specifically* was and remains so central to the conditions and relations of capitalist production? Fossil fuel is by no means the only source of energy capable of powering production, so what is so unique about fossil fuel that it can be considered to be internally power the forces and relations of capitalist production?

3.4 Capitalist Development and the Physical Properties of Fossil Fuels

The answer to the preceding questions lies in the “unique congruence of [fossil fuel’s] physical properties with the socioeconomic and political logics of capitalist development” (Altvater, 2006, p. 41). Fossil fuels, particularly oil, are both an extremely concentrated source of energy and a geographically mobile source of energy.¹⁷ These flexible properties gave it an incredible advantage for the purposes of powering both capitalism’s productive forces, and its means of circulating (transporting) commodities or goods. In other words, its properties made it perfect for the promotion and maintenance of the conditions for ever greater capital accumulation.

¹⁷ While there are clearly important differences to be made between oil, coal, and gas, for the purposes of this paper their properties as fossilized energy are similar enough such that the argument I develop regarding their physical properties applies consistently across them and does not require separate treatment.

Elmar Altvater (2006) has pointed out that in contrast to solar radiation, which powered the productive forces prior to the industrial revolution, fossil fuel does not change its intensity between day and night nor with the rhythms of the seasons. He notes that, on the contrary, “fossil energy can be used 24 hours a day and 365 days a year with constant intensity, allowing the organisation of production processes independently of social time schedules, biological and other natural rhythms. Fossil energies can be stored and then consumed without reference to natural time patterns, in accordance only with the time regime of modernity and a timetable that optimises profits” (Ibid., p. 41). Altvater has also pointed out that in general terms the Energy Return on Energy Input (EROEI) is very high for fossil fuel.¹⁸ This means that “only a small amount of energy needs to be invested in order to harvest much greater amounts of energy”, meaning it yields a high energy surplus (Ibid, p. 39).¹⁹ Altvater goes so far as to suggest that fossil energy, as compared to solar energy, “can easily come to seem responsible for the surplus value produced in a capitalist system” (Ibid.).

Just as important as its energy concentration and intensity properties, fossil fuel also uniquely facilitates capital accumulation because of its flexibility as a geographically mobile source of energy – that is, its *usability* for and in production, consumption and transportation purposes. Fossil fuel, unlike most other forms of energy, can be concentrated in certain geographical areas (such as urban spaces of production), a physical property that allowed for the “transformation of pre-capitalist patterns of space and place into capitalist ones” (Ibid. p.41). Being able to concentrate, or rather re-

¹⁸ In particular for oil or petroleum.

¹⁹ It ought to be noted that as the remaining reserves of conventional oil are exhausted from sources that do not require a lot of energy input, the exploitation of supplies that require higher energy input are being turned to more frequently (for example, off shore drilling).

concentrate, fossil energy in certain spaces has meant that, since its discovery, the local availability of energy resources is no longer the principal factor that needs to be considered when capitalists seek to locate their manufacturing or other energy-intensive industries. Instead, energy supply is simply one among many other factors to consider. The ability to concentrate fossil fuel in certain geographical areas means it can also be concentrated for transportation purposes (for example, in pipelines or on tankers) to just about anywhere in the world. This is a factor that Altvater contends gave rise to “the logistical networks which today cover the globe.” (Ibid)

Fossil fuel’s physical properties, in particular those of petroleum, not only make it amenable to transportation but also, crucially, enable it to *power* that transportation. The magnitude of the impact that the fossilization of transport has had on the expansion of capitalism cannot be overstated. Before the discovery of fossil fuel as an energy source, there were immense biological restrictions to the transportation of goods. As Huber (2009, p.112) points out, “[p]rior to the emergence of large-scale industry powered by fossil fuels, commodities were transported via walking, horse-drawn vehicles or waterways...It is not likely that the magnitude of commodities produced by large-scale industry could find markets through these biologically based transportation systems.” “Under capitalism”, he adds, “the process of production creates spatial conditions of circulation that become part and parcel of the process of becoming a commodity. A commodity is not a commodity unless it is exchanged, and due to the enhanced productive power of fossilized industry, the sphere of commodity relations gets increasingly extended to the world scale” (Ibid, p.111). The emergence of a global marketplace for goods was enabled by spatial conditions associated with fossil energy

powered production, and fossil energy powered transport. It follows then that the very emergence of mass production and mass consumption practices in general remain dependent upon the provision of fossilized energy, not only to power the (accelerated) production of commodities, but also to augment the global circulation of these commodities.²⁰ In light of this dependency, the historical fossilization of transport ought to be conceptualized as an internal aspect of the historical evolution of the current capitalist mode of production (Ibid.)

Confronting what Huber (2009, p.105) calls the “mutually constitutive relations between energy and society” is daunting. But from the perspective of the need to reduce ghg emissions it is indispensable. As the incisive analysis outlined above suggests, modern capitalist social life is profoundly dependent upon the abundant provision of carbon-emitting fossil-fuel energy. The scale of this dependency is tremendous if we begin to think of the constant need to power the litany of contemporary “necessities” that structure our lives today, particularly for those of us living in modern capitalist economies: the productive forces of industry, the power plants that provide energy to homes and businesses, global transportation systems (including everything from personalized automobiles to marine and aircraft shipping); the list seems endless.

If the international community hopes to seriously reduce ghg emissions, the ‘fossil-fuel mode of production’ needs to be the target of fundamental and systemic change. Evidently, the climate discourse ought to be offering critical reflections upon the costs and benefits of indiscriminate economic growth and the integral role that fossilized

²⁰ For an excellent analysis of the ecological (and cultural) implications of the automobile and the politics of the automobile, see Paterson (2007).

energy continues to play in facilitating the current conditions for capital accumulation. Instead, we find in the Kyoto protocol a governance regime embedded in a growth-driven liberal economic order, in a global capitalist system that relies on the provision of ever more fossil fuel to power its growth. The policy mechanisms in Kyoto belie its stated intent to work to address the climate crisis through reducing ghg emissions. As I have demonstrated thus far, these mechanisms are predominantly market-liberal style approaches designed to foster reductions only in so far as a state's efforts to ensure the conditions for the competitiveness of their firms in the global market are not negatively affected. Growth in the global economy remains the primary objective. Thus, the dominant climate discourse, as it stands, seems more likely to promote economic activities that exacerbate rather than mitigate the climate crisis.

3.5 Metabolic Rift Theory and the Global Carbon Cycle

The preceding discussion of the historical development of global capitalism leads me to a most critical point of elaboration in my argument. Now, the burning of fossil fuel in both the production and circulation processes causes CO₂ to be generated as waste in the atmosphere. Combined with the expansionary drive of capitalism, however, this means that CO₂ continues to be pooled there at ever-increasing rates. Recent scholarship in environmental sociology and ecological Marxism has argued that not only is this pooling an unavoidable outcome of the dynamics of the capitalist system, but that this pooling has occurred at a rate faster than natural systems or 'carbon sinks' can absorb them (i.e., beyond the carrying capacity of carbon sinks). This scholarship builds on a long standing Marxist tradition, beginning with Marx's own discussion of capitalism's tendency toward a crisis of overproduction, that views contradiction as inherent to

capitalism itself. One important example is Polanyi's (1957) famous characterization of capitalism's dangerous and destructive commoditization of land (or nature), labor, and rent: the so-called creation of "fictitious commodities". More recent scholarship has sought to explicate specifically the contradictory relationship between capitalism and nature. James O'Connor's (1996, 1998) influential "second contradiction of capitalism" thesis, for example, describes how capitalism inherently degrades the 'conditions of production' (including nature) due to the finite character of these conditions and the voracious appetite of capital in exploiting (and depleting) these conditions in the name of accumulation and expansion.

The work most relevant to my current argument, however, is what is known as the 'metabolic rift theory.' Broadly, this theory refers "to an ecological rupture in the metabolism of a system" (Clark and York, 2005, p. 400). First conceived of in relation to the soil nutrient cycles by agricultural chemist Justus Von Liebig, it was adopted and expanded upon contemporaneously by Karl Marx, it was recovered and expanded upon more recently by preeminent ecological-Marxist scholar, John Bellamy Foster (1999, 2000). The metabolic rift theory is rooted in an analysis of one of the foundational concepts of ecology: the relationship of *exchange* within and between nature and humans. In the metabolic rift theory, Marx accounted for the dialectical relationship between nature and society. He posited that through labor humans not only confront the conditions imposed by natural processes in the material world but that they also in turn

affect them. This dialectical relationship means that natural processes (such as the carbon cycle) are in fact inseparable from the social relations of a given time.²¹

The mutually transformative dynamics of the nature-society relationship are important (if perhaps obvious), but for the purposes of my argument, it is the notion of the ‘rift’ that is of particular value.²² The ‘metabolic rift’ refers to human interruption in or interference with the metabolism of a natural system, one that results in the degradation or destruction of that natural system. Foster (2000) demonstrates that Marx viewed metabolic rifts as a necessary outcome of the conditions of capitalist relations of production. Due, for example, to the massive expansion and extension of trade across and between distant places, as well as the (related) increase in the concentration of populations in cities (what Marx spoke of as the growing division between ‘town and country’), capitalism leads to the physical displacement of energy and matter from one place to other places. This effectively takes this matter and energy away from the ecosystem in which it evolved, and where it could have been recycled, and displaces it elsewhere.

Marx applied this theory to his study of nutrient cycles in the soil.²³ The conditions of production that exist under capitalism, he argued, tend to prevent the natural recycling of materials within given natural systems. This is what is meant by the

²¹ The nutrient cycle, that ensures the fertility of soil, is one such example of a ‘natural process’ and this was Marx’s original area of concern in regards to the metabolism of natural systems under capitalism. See Foster (2000). For my purposes, I will be focusing on the carbon cycle.

²² For an excellent and comprehensive analysis of Nature in Marx’s historical materialism, with a detailed theoretical account of his understanding of nature in relation to the conditions and relations of production under capitalism, see Paul Burkett (1999).

²³ Clark and York (2005, pp. 399,400) describe succinctly Marx’s take on the degradation of the soil system under capitalist conditions: “Capitalism created an ‘irreparable rift’ (rupture) in the metabolic interaction between humans and the earth, one (...) intensified by large scale agriculture, long-distance trade, massive urban growth, and large and growing synthetic inputs (chemical fertilizers into the soil.) The pursuit of profit sacrificed reinvestment in the land, causing the degradation of nature through depleting the soil of necessary nutrients and despoiling cities with the accumulation of waste as pollution.”

development of a rift in a natural process or cycle. Clark and York (2005) have extended the application of the metabolic rift theory in order to specifically understand “human influence on the carbon cycle and its consequences” under the conditions of a now more advanced iteration of capitalism that exists today (Clark and York, 2005, p. 396). They argue that global climate change relates directly to the historical era and logic of capitalist social relations, and that the accumulation of CO₂ in the atmosphere as “waste” and its interference with the carbon cycle is intrinsically tied to industrial capitalist production.

The metabolic rift theory as applied to climate change seems to make sense if we accept the scientific understanding of the carrying capacity or natural limits of the atmosphere to cycle carbon. The theory is further supported by the fact that it was not until the emergence of industrial level capitalism that CO₂ emissions greatly expanded in scale. In the most recent of the United State’s ghg emission inventory assessments, the Environmental Protection Agency had this to say about the carbon cycle: “Billions of tons of carbon in the form of CO₂ are absorbed by oceans and living biomass (i.e., sinks) and are emitted to the atmosphere annually through natural processes (i.e., sources). When in equilibrium, carbon fluxes among these various reservoirs are roughly balanced” (EPA, 2010). Since the Industrial Revolution (or since approximately 1750) however, global atmospheric concentrations of CO₂ have risen about *36 percent*, an increase that is principally attributed to the combustion of fossil fuels and one that appears to be linked to a rupture in the ‘balance’ of the carbon cycle (IPCC 2007). This, I believe, lends considerable weight to the argument that the dramatic increases in the concentration of CO₂ in the atmosphere are tied to the current fossil fuel mode of production constitutive of the existing capitalist system.

There is an important point of departure here between the argument I am developing and the position of that of Clark and York and other ecological Marxist thinkers for that matter. While I am sympathetic to the ecological Marxist critique I have outlined thus far, one that views the degradation of the carbon cycle (and nature more generally) as internal to the forces and relations of capitalism itself, I differ in that I understand this tendency to be one internal to the *historically specific* character of the capitalist system that has existed to date – i.e. as internal to the fossil fuel mode of production rather than to capitalism *per se*.²⁴ Thus, as I return to in much further detail in the final section of this paper, I do not agree that any form of capitalism is necessarily incapable of mending the rift in the carbon cycle or of operating more soundly within the ecological limits of the planet more generally.

Nevertheless, I understand Clark and York (2005, p. 412) to be correct in arguing that the global capitalist system (at least in its current incarnation) depends upon massive quantities of fossil fuel in order to operate at the current scale of production to say nothing of an *increasing* scale of production. The recent opening of arctic wildlife havens to off shore oil drilling and the catastrophic oil spill that resulted after the malfunction of an under water drilling well in the Gulf of Mexico are potent reminders that capitalism's "constant demand for energy necessitates the continual plundering of the earth for new reserves of fossil fuel" (Ibid.). The effect of capitalism's expansionary tendency again comes into play as further capital accumulation seems to lead to the

²⁴ While there is insufficient room here to elaborate on this point, this analysis can also help account for the environmental destructiveness (including large-scale carbon emissions) of the economies of the former Soviet states. Though far from socialist, their state planned economies were also not capitalist and yet their economies do not appear to have been any more ecologically sustainable. In regards to ghg emissions, the fossil fuel mode of production seems to describe the forces and relations of their production to some degree as well.

exploitation of more and more fossilized energy sources thereby reproducing the rift in the earth's natural carbon cycle. To reiterate, the rift is evidenced by the fact that emissions stemming directly from anthropogenic sources, namely through industrial capitalist production and circulation, not only pools CO₂ as "atmospheric waste" at unprecedented and ever-accelerating rates, but this accumulation of CO₂ occurs at a rate that the natural carbon sinks can no longer metabolize (i.e., absorb).²⁵

The metabolic rift in the carbon cycle presents serious, if not damning implications for the coherency of the norms that underpin the dominant climate discourse. With the fossil fuel mode of production that continues to characterize global capitalism today, CO₂ continues to create a metabolic rift in the carbon cycle. How then, we must reflect, can reducing ghg emissions be compatible with the maintenance and expansion of a liberal economic order, an order that reinforces the kind of conditions that have led to the generation and accumulation of emissions in the first place? Liberalizing global trade and finance, for example, would not be possible without the exploitation of the physical properties of fossil fuel. For both the production and circulation of goods, current trends in global trade seem to be tied inextricably to the exploitation of fossil fuels. The preceding discussion strongly suggests that a solution to the climate crisis cannot be found unless the productive forces of the system are radically transformed. This kind of radical transformation is absent from the Kyoto Protocol as well as the ongoing post-2012 climate negotiations. The dominant climate discourse, embedded as it is in the fossil fuel mode of production, is fundamentally flawed. It remains difficult to

²⁵ The rift is further compounded by the destruction of carbon sink capacity through the pollution of the oceans as well as through large scale deforestation and other degradation of terrestrial sinks; these interruptions are also linked to the expansionary dynamics of global capitalism. Thus, capitalism is disrupting the carbon cycle at two points, through the emission and pooling of carbon and through the destruction of sinks. See (Clark and York, 2005, pp. 413, 414).

envision how the international community of states will ever meet the steep reduction targets the IPCC deems necessary to avert a climate crisis within the prevailing socio-economic structures of capitalism today.

3.6 The State and its Compromised Relationship to Capital

In this final portion of my structural critique, I turn to critical theories of the state. In the context of addressing climate change, the relationship between the modern capitalist state and capital more generally, merits close consideration.²⁶ States, of course, are the primary actors who take part in international governance regimes, and in the Kyoto Protocol advanced capitalist states took on mandatory emission reduction targets. Now, I have already highlighted that the compromise of liberal environmentalism expressed in the norms and policy mechanisms of the Kyoto Protocol was geared toward facilitating conditions for the ‘competition state’ to sustain and even perpetuate capital accumulation within a competitive global business climate. I then demonstrated that this “compromise” in fact precludes states from being able to achieve the emission reductions that the compromise purports to seek. It is worthwhile, however, to elaborate further on the inability, structurally, of the modern capitalist state to reduce its ghg emissions. I accomplish this through a more explicit discussion of how the modern capitalist state relates to the global capitalist system. I show why the modern capitalist state is deeply compromised by what can be described as its “parasitical dependence” on private capital accumulation (Eckersley, 2005, p.161). Explicating this ‘parasitical dependence’

²⁶ While, admittedly, I lose some measure of specificity and explanatory power by focusing on the somewhat broadly construed category of the ‘modern capitalist state’, I choose this term because it applies to a range of countries in the international community that operate within various different varieties of capitalism. I am attempting here to theorize about structural conditions and relations that are held in common across a broad spectrum of modern states. The critique, of course, applies more to industrialized or so-called advanced capitalist states, those that have been emitting carbon for the longest period of time and those, not coincidentally, that are therefore (historically) responsible for creating the rift in the carbon cycle.

between the capitalist state and capital adds an additional layer to the thickening case I have built thus far for the need to transcend the existing climate discourse.

From a critical political economy perspective, theories of the state have evolved considerably from the more traditional Marxist interpretation of the state apparatus as being under the “exclusive political sway” of the ruling class, or of the executive of the state as little but a “committee for managing the common affairs of the whole bourgeoisie” (Marx, 1987, p.223).²⁷ More nuanced understandings of the state have evolved to explain happenings that did not quite fit this overly simplistic and perhaps sinister conception of the state and class conflict Marx outlined; happenings such as the ascendance of the welfare state. Eckersley (2004, pp. 54-55) points out that as early as the 1970s, post-Marxist theorists such as O’Connor (1973), Habermas (1973), and Offe (1984) “drew attention to the state’s contradictory imperatives to facilitate capital accumulation, on the one hand, and to iron out the harmful social and ecological consequences of capital accumulation by providing an expanding menu of protective welfare (and environmental) services, on the other hand.” These welfare states, so the argument goes, balance their accumulation imperative, or what Hunold and Dryzek (2005, p. 77) call “the economic imperative”, with securing the public support that underpins their political stability – i.e., the legitimacy of their rule.

Eckersley’s (2004, ch.3, p. 53-64) excellent summary of this literature is worth quoting at some length. The state’s interest in safeguarding the interests of capital can be understood as more “institutional” than as the workings of some dominant class conspiracy. The state, she argues, has a “functional dependence on the flow of revenue

²⁷ Marx himself, of course, developed a more nuanced analysis than this often referenced quip taken from the Communist Manifesto. Contemporary debates about the relation of capitalism to the “state system” have received immense attention in recent critical IPE scholarship. See Callinicos (2007).

(principally taxation) that private capital accumulation provides” (Eckersley, 2004, p.55)

This “functional interdependency” means the state is charged with holding up the interests of “capitalist *society*, including workers, investors, and consumers, rather than merely the interests of the capitalist class standing alone” (Ibid., pp. 55-56). We can think here, for example, of the state facilitating a social service such as enforcing air quality standards or providing unemployment insurance benefits. While the state provides “the necessary legal and social infrastructure for businesses to flourish, as well as those facilities and services that contribute to the growth of capitalist society”, it also responds “to public pressure to redress the negative social and ecological ‘side effects’ generated by private capital accumulation”, two of which are air pollution and a constant fluctuation in the competitive job market (Ibid.).

However, a fiscal crisis for the state emerges from the fact that its capacity to combat threats to its legitimacy, that is, through alleviating the negative externalities stemming from capital accumulation, is “typically dependent on *also* performing successfully the function of maintaining private capital accumulation” (Ibid.). So while the need to legitimate state policies that support its economic imperative leads to the generation of policies that redress the harms of capitalist development, “the boundaries of successful policies are invariably set by the buoyancy of the economy” as a whole (Ibid.).

When it comes to dealing with the most pressing externality of capital accumulation in relation to the climate crisis, the emission of ghgs into the atmosphere, this assessment of the functional interdependency between the state and capital carries important and troubling implications. Because policies that aim to reduce ghg emissions are likely to interrupt economic growth, the likelihood that these policies will be more

than token gestures or exercises in ‘political management’ seems negligible. This point carries particular weight today in light of the increasing pressures of economic globalization, and the corresponding rise of the liberal competition state discussed earlier. This type of ‘economy first’ state policy is not difficult to identify in an era where economic growth requires governments to act to prevent the flight of capital and jobs through the provision of a favourable and competitive climate for financial investment. For example, this logic was in full, unabashed display at the most recent Group of 20 meetings held in Toronto, Canada in June of 2010. Re-establishing growth in the global economy in the aftermath of the recent ‘global recession’ dominated the agenda, as the leaders of the world’s 20 most important economies met to discuss bank sector regulation reforms, state budget deficit reductions and the necessity of imposing fiscal austerity measures to reign in state debt.²⁸ Illustratively, the issue of global climate change, dire as it is and just half a year removed from the failure of the international community at COP15 in Copenhagen to come to an agreement on a post-2012 climate treaty, did not even make it onto the agenda.²⁹

Worrisomely, governments in democratic states appear to be even more acutely compromised when it comes to addressing environmental externalities of capital accumulation. Colin Hay (1994, p. 217) has argued that states reliant on societal consent develop complex “responsibility and crisis-displacement strategies” designed to preserve their “legitimacy with respect to environmental issues while failing to engage in the collective, interstate response necessary to address crisis tendencies that are inherently

²⁸ Regular analysis and discussion of the G20 and G8 summits are available online at, <http://www.g20.utoronto.ca/>.

²⁹ It is worth noting that Canadian Prime Minister Stephen Harper was reported to have worked hard to make sure climate change was not on the agenda (CBC, 2010), a predictable move for the country whose emissions continue to grow exponentially in defiance of its binding Kyoto reduction commitments.

global in nature.” Sceptically, Hay maintains that the “underlying rationality of democratic representation encourages states to restrict their responses to such crises to the minimum they perceive necessary for short-term restoration of legitimacy” (Ibid.). The logic of the dominant climate discourse (never mind the questionable mechanisms it has put forth to facilitate reaching emission reductions) should perhaps be interpreted in the context of the “tactical or cosmetic level” at which states respond to threats to their legitimacy caused by environmental problems like climate change (Ibid, p.221). With a short time horizon between elections (which ideally are *the* make or break test of a government’s legitimacy), states “are prone to adopt a definition of the national interest predicated on the necessity for continued economic growth”, not the long term resolution of an environmental problem (Vogler, 2005, p. 246).

Compounding the capitalist state’s difficulty in addressing environmental problems such as climate change is the explicit structural power capital wields in light of the state’s economic imperative. Paterson (2000, p.46) argues that in a growth-driven global capitalist system, “those who own the means of production gain a structurally powerful position within states.” While perhaps not the simplistic reference to a class conspiracy Marx spoke of in the Communist Manifesto, Paterson argues that wielders of capital, as those organizing growth, “gain a great deal of power with respect to state decision-making” and can “come to have a veto power in relation to state policies” (Ibid.). In the context of state efforts to address the climate crisis (both domestically and internationally), the role that fossilized energy plays in so many aspects of contemporary capitalist social life cannot be overlooked: the interests of a very many key economic sectors are at stake in this process.

Since the climate change issue emerged onto the international agendas in the late 1980s, the structural power of certain capital enabled fossil fuel and its associated lobbies to limit the scope of state responses to the problem (Newell and Paterson, 1998). This was done primarily through intensive lobbying by the fossil fuel industry not only at the global and regional levels, but in the domestic arena of many key capitalist states such as the United States. There, as in many other countries, lobbies put pressure on government not to enact policies to reduce CO₂ emissions which they strategically, if predictably, equated to unsound, anti-growth economic policy. Newell and Paterson (1998) have documented extensively the vociferous opposition fossil fuel lobbies, particularly the umbrella coalition group known as the GCC (Global Climate Coalition), expressed towards proposed emission reduction goals for industrialized countries before and during the Kyoto Protocol negotiations. Many of these same lobby groups also came to support the flexibility mechanisms that eventually ended up in the Kyoto Protocol once, that is, they saw them as an opportunity to make profitable gains.

In summary, the modern capitalist state's economic and legitimacy imperatives clearly complicate its capability to enact policies that can reduce ghg emissions. In this sense, the norms underpinning the dominant climate discourse including those market-liberal mechanisms found in the Kyoto Protocol, fit precisely with the kind of tactical or cosmetic approach that capitalist states are prone to make when legitimacy crises arise and threaten to impinge on economic growth. They seem to address concerns about the externalities of economic growth and, yet, also continue to satisfy key corporate interests. The fossil fuel industry did not get its way entirely in relation to the outcome of the international climate negotiations, as they were not able to secure a status quo of

complete inaction with regards to the setting of binding international ghg emission reduction targets. Capitalist states were able to discharge legitimacy pressures through acting to sign a climate treaty that for all intents and purposes completely safeguards the state's economic imperative while making token gestures towards reducing emissions. Evidently, the dominant climate discourse does not pave the way for states to achieve ghg reductions but rather continues to reflect the broader interests of certain economic sectors, most visibly the fossil fuel industry and the commanding heights of new green capitalist ventures.

4 Conclusion

4.1 Toward an Alternative Energy Mode of Production

The foregoing critique ought to have made this much clear: the metabolic rift in the carbon cycle cannot be mended within the structures of the current capitalist system. If the pending climate crisis is to be averted, and aggressive cuts to ghg emissions realized, a new climate discourse must be constructed in place of the woefully inadequate one that has a stranglehold over the current trajectory of the international response. Confronting the climate crisis requires confronting the destructive arrangements perpetuated by the existing order. It requires developing strategies that can *realistically* transform and transcend the destructive practices constitutive of contemporary capitalist social life. This means, first and foremost, coming to terms with the deep embeddedness of capitalist production and circulation in fossilized energy and ultimately moving towards an alternative energy ‘mode of production.’

In the spirit of critical theory’s method of immanent critique, I maintain that any changes that are to come about are necessarily bound by and, thus, must emerge from existing structural arrangements. Therefore, my thoughts on a way forward differ somewhat from more radical strategies advocated by eco-Anarchists like Murray Bookchin (1982), from de-globalizers such as Bello (2002), Cavanaugh and Mander (2004) and North (2009), and most importantly from ecological-Marxists/eco-socialists like O’Connor (1998) and Foster (2000). While my overall critique of the dominant climate discourse has relied on portraying the strength of the ecological-Marxist description of the contradictions of capitalism, I break from this tradition in two important ways: (1) I do not understand the rift in the carbon cycle to be inextricable from capitalism, but rather I understand it to be immanent to the fossil fuel mode of

production constitutive of the *current form* of capitalism³⁰; (2) building on this previous point, I do not see the capitalist state as an actor necessarily incapable of addressing climate change and other environmental problems. I cannot envision a shift to an alternative energy economy, much less any new approach to addressing the global climate crisis, that does not engage with the existing institution of the state or that is somehow “post-state.” As Eckersley (2004, p. 5) notes, “one can expect states to persist as major sites of social and political power for at least the foreseeable future ...[A]ny green transformations of the present political order will, short of revolution, necessarily be state dependent”. In light of the pressing time frame presented by climate change trends, theorizing ways to foster a global alternative energy economy completely outside of the existing state system seems to me to be both naive and counterproductive.

In Eckersley’s (2004, p. 7) thoughtful and important book, *The Green State*, she argues that “there are few social institutions that can match the same degree of capacity that states have to redirect societies and economies along more ecologically sustainable lines”. I tend to agree. Even in the age of the ascendant neoliberal economic order, capitalism still relies on the national legal systems of states to “provide basic stability, contractual certainty, and the protection of private property rights, both nationally and internationally” (Ibid., p. 65).³¹ What else but the state has the ability to deploy the

³⁰ O’Connor (1998), I think, is still correct to say as he does in his second contradiction thesis, that capitalism inevitably degrades ‘nature’ as a condition of production. While I outline a vision of a more ecologically-bounded capitalist system here, I do not claim that it is capable of escaping the exploitation of nature wholesale as nature must always be a condition in capitalist production. Rather, I understand there to be better and worse forms of exploitation, and understand fixing the rift in such an important natural system as the carbon cycle as a continuing possibility.

³¹ Eckersley (2004, p. 256) explains that state legal systems play a pivotal role in generating and upholding property rights, contracts, the rules of commerce, taxation, accounting, employee-employer relations, and liability that shape patterns of investment, production, consumption, and reproduction. For a more comprehensive treatment of this side of the functional interdependency of capitalism and the state in the age of economic globalization, see Sassen (1996, 2002).

regulatory and fiscal mechanisms in order to foster a move toward alternative energies?

While it must constantly contend with the structural power of capital, the state has a much greater steering capacity than the market “to discipline investors, producers, and consumers”, and to regulate and even proscribe certain destructive arrangements that emerge from capital production, circulation, and accumulation.

My intent is not to develop in detail how a new climate discourse can or should emerge, a significant theoretical project in its own right to say the least. Still, in light of the urgency of the critique developed here, it is necessary to outline in some manner what a capitalist state committed to fostering an ‘alternative energy mode of production’ might look like. Overcoming the capitalist state’s compromised relationship with capital is dependent on a comprehensive transformation and re-imagination of the economic and legitimacy imperatives of the state, in ways that will yet allow it to harness capitalism’s enormous (innovative) potential to help revolutionize the technological bases of the instruments of production – in this case, revolutionizing the energy sources that *power* the instruments of production and circulation.

Again, Eckersley’s impressive theorizing about the development of ‘green states’ serves as a helpful model here. A crucial role of the ‘green state’ would be “to establish democratically the ecological parameters within which all economic activity is to take place” (Barry and Eckersley, 2005, p. 259). The imperative of the state would be to act first and foremost as an ecological steward rather than a facilitator of capital accumulation, economic activities would be bounded by ecological constraints and the state would play a vital role in disciplining and correcting market-failure.³² “The

³² For an invaluable defense of the role of the state in producing environmentally beneficial outcomes while maintaining the basic institutions of private property and the market, see Daly and Cobb (1989). A critical

appropriate role of the state, then is to introduce ceilings, bottom lines, minimal standards and general limits to *contain and* channel market transactions in way that limit the rate of material-energy throughput, so that the economy operates safely within the carrying capacity of ecosystems” (Eckersley, 2000, p. 242). In the case of addressing ghg emissions, this means perhaps even curtailing certain practices so as to respect the integrity of the metabolism of the carbon cycle. The state, for example, could use indicators about concentrations of carbon dioxide in order to plan its economic policy. It would retain the power to control the broad parameters of economic activity but would be open to employing the use of market-based measures like carbon taxes, subsidies, and the use of tradable emission permits to reach its goals. At the same time, it would not rule out prohibiting economic activities (like the exploration and exploitation of new sources of fossil fuel) that clearly threaten the integrity of the atmosphere.

Thus, this re-imagined state would not abandon capitalism per se. As Eckersley (2004, p.83) explains, “on the one hand, the green state would still be dependent on the wealth produced by private capital accumulation to fund, via taxation, its programs and in this sense it would be a capitalist state. On the other hand, securing private capital accumulation would no longer be the defining feature or primary *raison-d’être* of the state”. The state would become more reflexive and responsive to ecological norms. “The purpose and character of the state would be enlarged and therefore be different. In this respect the green democratic state can be understood as a *postcapitalist* state” (Ibid.).

point these ecological economists make is that there are physical limits to economic growth and that this fact is generally not accounted for in measures of growth. The prices of finite natural resources, and the externalities caused by their exploitation, are immensely distorted in current markets. Few environmental costs of production and consumption are incorporated into the prices of goods.

Harnessing capitalism's propensity to foster unparalleled technological advances will be critical to upholding the ecological imperative of the postcapitalist state, particularly in regard to climate change. The shift away from fossil fuel, for example, requires the state to guide –through its fiscal and regulatory steering mechanisms– strong or 'reflexive' forms of ecological modernisation, particularly strategies geared towards promoting the development of alternative and renewable energies. Green capitalist ventures (and the continued existence of private firms) would be an important element of the mix.

But, a critic might ask, are there not already state efforts to foster the development of green technology and is this not what the dominant climate discourse is devoted to doing? The weak ecological modernisation strategies pursued by states and green firms today do not go nearly far enough. As I mentioned earlier, contemporary modernisation strategies focus on improving the efficiency of production processes through technological fixes or advances, a strategy that rarely questions the logic of ever-expanding output or the broader purpose and meaning of the modernisation process itself. Improvements in eco-efficiency do not necessarily lead to a decrease in environmental degradation.³³ In light of the expanding scale of capitalism, it has been observed that economic growth effects tend to swamp advancements in efficiency gains, “diminishing the potential for developing ecological sustainability based on technical fixes” generally (Clark and York, 2005, p. 397).³⁴ Even technology transfer, a strategy promoted explicitly in the Kyoto Protocol, often overlooks the fact that without the requisite state subsidies, the environmental benefits of transfers are questionable. More

³³ For example, improving on the efficiency of car engines does little to reduce aggregate ghg levels when examined in the context of the expanding production of cars.

³⁴ This, an example of what is known as the 'Jevons paradox' (i.e. that increasing efficiencies in some ways only encourage increasing demand and tend not to lead to decreasing amounts of throughput energy).

environmentally sound green technology is often very expensive in the ‘open market’ and most of the countries of the developing world might well have to export natural resources in order to buy it, thereby creating more environmental destruction and potential ghg emissions to be in a position to purchase it (Castro, 2004, p. 200).

In contrast, the establishment by the state of more “reflexive” kinds of ecological modernisation strategies would force “a self-confrontation by industrial society with ecological consequences that cannot be addressed by the mere perpetuation of existing ideas, institutions, and practices of governance” (Eckersley, 2004, p. 79). Reflexive modernisation would become a means of systematic societal transformation. It would call into question not only this specific production process or that one; rather, it would challenge the logic of the broader political economy, questioning not only production processes but related dynamics of “reproduction, distribution and consumption” that are part and parcel of the existing liberal economic order (Barry and Eckersley, p. 260).³⁵ If we accept a dialectical understanding of the energy-society relationship, then it follows that replacing fossil fuel with alternative source of energy will fundamentally alter capitalist social life as we now know it. The hope is that changes will be in the direction of a more ecologically sustainable society on the whole, not just in regards to the emission of ghgs.

These are the types of developments that will be necessary in order to construct a new international climate discourse. If international climate policies are to come to respect the integrity of the natural metabolism of the carbon cycle critical reflection on

³⁵ Hunold and Dryzek (2005, p. 84) provide a good example of this distinction between a weak and strong modernisation strategy: “So, for example, rather than promoting lower-polluting and more efficient car engines, public policy would address the issue of why private cars are such a large part of the transportation mix, and why cities are constructed with such large distances between homes and workplaces.”

the immense range of practices and arrangements that currently rely on burning fossil fuels will be imperative. So too will the states role in regulating, guiding, and providing incentives for the private sector to develop more environmentally benign replacements for fossil fuel. This, of course, raises the question of whether the state is fundamentally compromised when faced with introducing measures that compromise capital accumulation (i.e., addressing ecological problems through regulations). The transformation I am putting forth will undoubtedly impact the profit margins and fundamental viability of certain industries, particularly those associated with fossil fuel. There will necessarily be stiff resistance from organized industry and other key economic actors that make reaching this radical transformation a difficult task. However, because the state I envision would provide opportunities for certain kinds of capitalist ventures, there is at least some potential for the state to formulate allies in the private sector. Still, the revenues that states use to fund these reforms will remain, to some degree, fiscally “parasitic” on private capital accumulation and the inclination to address climate change at token or cosmetic levels in order to satisfy threats to legitimacy will be a continuing worry.

If modern states move towards the direction of an ecologically-bounded capitalism and act collectively to foster modernisation strategies that deal critically with fossil fuel dependence, a new climate discourse with the capacity to curb the socially and ecologically harmful consequences of capitalism is not out of the realm of possibility. But the state will only be capable of transcending the current order if a political/democratic consensus is developed and maintained around the desirability of ecologically sustainable economic policy. There must be a strong and continual

democratic consensus that the legitimacy of any state policy is tied to respecting the ecological limits of our planet's ecosystems. The building of this type of democratic consensus is a pressing matter that ought to concern us all.

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