LAMENT FOR THE KYOTO PROTOCOL:

another nail in the coffin of neoliberal multilateralism?

Mark Purdon

PhD Candidate, Department of Political Science
University of Toronto
Sidney Smith Hall, Room 3018
100 St. George Street
Toronto, Ontario M5S 3G3, Canada
Email: mark.purdon@utoronto.ca

Paper presented at the:
80th Annual Conference of the Canadian Political Science Association
University of British Colombia

Session D10(b): The Politics of Climate Change

6 June 2008

Draft Version
Please do not cite without author's permission

Introduction

This paper seeks to examine the politics of climate change from the vantage of IR theory, particularly the neorealist-neoliberal debate that has dominated the field until quite recently. As I hope to show, international environmental politics continue to be interpreted within the horizon of neoliberalism. This paper considers the virtues and vices of the Kyoto Protocol in light of the question: what would a neorealist climate change regime look like? While the major debate in IR theory has since moved towards rationalist-constructivism, considering climate change from a neorealist perspective expands our political ontology and offers a unique window to understanding the current trajectory of the politics of climate change. Important here is to recognize that we are operating at the level of ideas. I agree largely with Wendt (1992) that anarchy is what states make of it, but if states choose to make anarchy a neorealist one, we should be prepared to address it on these terms.

This paper suggests that as climate change becomes more real in the minds of world leaders, a neorealist response to climate change is emerging which could be radically different from the current regime embodied by the Kyoto Protocol. A neorealist response to climate change would prioritize state survival though remaining pessimistic about the prospects of international cooperation, for which reason it might escape undetected if we are looking for a multilateral regime. Economic growth remains the dominant paradigm, but its motivation changes from growth for gain to growth for survival. At the extreme, a neorealist climate change regime would prescribe statist adaptation measures rather than enter into a costly international mitigation "security dilemma" with other major emitters and would have little interest or spare finances for climate change adaptation in less developed countries. At its best, a neorealist climate change regime would champion self-help, nationally-oriented technological solutions for climate change through voluntary international associations.

The above sketch of climate realism suggests we might gain greater understanding of international environmental politics by examining different political positions based on the degree and type of international cooperation required to respond to climate change, here considering efforts both to mitigate and adapt to climate change. Much of the current debate has seen Kyotophiles criticized from both sides by Kyoto Skeptics and Social Greens (witness Lohmann, 2006; Prins and Rayner, 2007a; Schellnhuber, 2007). To put it simply, Kyoto Skeptics and Social Greens are doubtful of the capacity of the UN to create, coordinate and enforce a massive, artificial market of carbon credits, especially ones representing real emission reductions. They routinely criticize the Kyoto Protocol's carbon market—particularly its primary carbon offset body, known as the Clean Development Mechanism (CDM)—as an "illusion of action", "market fix" or "fantasyland" (Lohmann, 2006; Prins and Rayner, 2007b; Victor, 2001). These generally agree on the need for "bottom-up" domestic action such as a global carbon tax amongst a reduced number of key countries. But Kyoto Skeptics also recognize that the shift away from fossil fuels remains a challenge for all countries, suggesting that capital intensive technologies such as carbon capture and storage (CCS) are becoming a practical necessity (Jaccard, 2005; Metz et al., 2005; Wilson et al., 2008) and that there is a need to break the "taboo" on adaptation (Prins and Rayner, 2007a; Prins and Rayner, 2007b). The international carbon market would be better abandoned or, if retained, will whither away itself as its flaws become manifest. On the other hand, Kyotophiles believe it is necessary to stay the course and that solutions such as a carbon tax and CCS are compatible with the existing Kyoto framework.

I suggest however that the more vocal critics become about the failures of the carbon market and the need for domestic "at-source" mitigation strategies, the more their position tends to resemble that of climate change neorealism. By reducing the scope of the international carbon market, such strategies rely less on international cooperation to be effective. On the international dimensions of climate change, critics believe that engagement with developing countries and

international adaptation are better addressed through public finance and diplomacy or, particularly amongst Social Greens, by the industrialized world showing by example. Unfortunately, this move pays insufficient attention to the politics surrounding the financing of climate change adaptation, which will bear many similarities to politics of international development. It is estimated that an "additional" $28-86 billion is needed annually to help those in the developing world adapt to climate change (UNDP, 2007: 190 & 194; United Nations, 2007: Exec. Summary, para. 26). Is this politically feasible through current aid channels?

While additional sources of finance should be pursued, it would be premature to "ditch" the international carbon market. By harnessing self-interest and seeking to establish a market that works for least developed countries and economies in transition alike, will likely prove a more stable source of financing for the additional funds necessary for adaptation than other, more traditional sources of international assistance. In other words, if we consider the CDM as a vector for sustainable development and not solely for climate change mitigation, we might come to a different interpretation of its relative worth in the climate change regime. Oddly enough, it may be that the more *realistic* one becomes about the need for climate change mitigation, the more idealistic one becomes about the necessity of international finance for adaptation.

Sketching Neoliberal and Neorealist Environmentalism

From Neoliberal Environmentalism…

The current understanding of international environmental politics operates within the horizon of neoliberalism. For example, Clapp and Dauverge (2005) identify "four environmental world views": Market Liberals, Institutionalists, Bioenvironmentalists and Social Greens. Market failures and poor government policy are the cause of environmental problems for Market Liberals, while Institutionalists identify weak institutions and inadequate global cooperation as the source of environmental problems; for Bioenvironmentalists overpopulation and overconsumption are to blame, while for Social Greens it is global capitalism itself (Ibid.: 14-15).

There are two problems with such a framing. First, it conflates competing ideas and restricts the interpretation of international politics along multilateral economic lines. Market liberalism is a particular type of Institutionalism. It is a form of multilateralism, which is itself a particular type of international regime resulting from a particular international order. Different international orders ("constitutive rules") can lead to different regimes (Ruggie, 1992).[1] As Ruggie has observed, those international organizations now associated with market liberalism such as the IMF and World Bank were first initiated as an American project to extend the New Deal regulatory state into the international arena—what Ruggie has called elsewhere "embedded liberalism": a form of multilateralism that is compatible with the requirements of domestic stability (Ruggie, 1982: 399). This only gave way to "laissez-faire" liberalism (what is now commonly understood as neoliberalism) in 1971, with the gold-standard crisis (Ruggie, 2007). But during this transformation from "embedded liberalism" through to neoliberalism, the multilateral institutional character of the international regime was maintained—the defining feature of *American* hegemony (1992: 568). Neoliberalism is therefore not devoid or distinct from international institutions. Just the opposite is true: powerful institutions such as the IMF and World Bank have been necessary to create the laissez-faire conditions associated with

[1] For example, American multilaterlism and the bilateral economic system anticipated by the Nazis had they won World War II are the result of different international orders. That is, American multilateralism and Nazi bilateralism operate under different "constitutive rules that order relations in given domains of international life—their architectural dimensions" (Ruggie, 1992: 572). A regime is more concrete than an order (Ruggie, 1992: 573), best described using Krasner's (1983: 1) definition as "principles, norms, rules, and decision-making procedures around which actors' expectations converge in a given issue area."

international trade under neoliberalism. As Polanyi (2001 [1944]: 147) has long argued: "Laissez-faire was planned."

But second, this conflation leads to the popular conception amongst environmentalists that neoliberalism represents the extreme Right of the political spectrum, opposite to some alternative form of social democracy or green socialism—as can be discerned from many a book title on sustainable development or globalization (see Craig, 2006; Nieuwenhuys, 2006; Powell, 2007). It is a binary opposition: neoliberalism vs. socialism. But there are signs that the heyday of neoliberalism is behind us. Some have pointed to the rapprochement between the UN and Bretton Woods institutions, referred to variously as the "Monterrey Consensus", "Global Third Way", and a "Centre Right" compromise (Pauly, 2007: 102; Thérien, 2007: 87). Indeed, a dose of humility is found amongst the Bretton Woods institutions and their narrow focus on growth (Ravallion, 2001; World Bank, 2005).

But others see the weakening of neoliberal organizations such as the IMF and World Bank as a result of their need to be more accommodating to emerging powers. States such as Russia, China, Brazil and India are at this point quietly withdrawing from these institutions (Woods, 2008) and expanding their own spheres of influence (Azar, 2007). As Woods explains:

> *Seriously under-represented [in the IMF and World Bank] are emerging economies. But they are not desperately calling for reform. They have alternatives: they are stockpiling their own reserves (and hence have little need of the IMF); in some cases they are setting up their own multilateralised swaps arrangements (the CMI); they have access to multiple sources of development financing (and hence little need for World Bank loans); they are planning new multilateral development initiatives (the Bank of the South); and several now have their own aid programmes. They are not formally disengaging from the IMF or World Bank but in practice the institutions have slipped to the margins of their policy-making since they have little confidence that the agencies will act as multilaterals rather than as agents of the OECD, G7 or G1 economies (Woods, 2008: 2).*

Emerging economies are acting in this manner because their experience with neoliberal institutions has been disastrous. Commentators such as Martin Wolf of the *Financial Times* have lamented that we no longer have the political will to muster an organization like the IMF (see Wolf cited in Dodge and Murray, 2006). As Rodrik (2006: 974) points out: "[t]he question now is not whether the Washington Consensus is dead or alive; it is what will replace it."

In hypothesizing what is next, we should recognize that neoliberalism is the fruit of the long debate between realists and idealists in IR theory. Liberal idealists whose ideas permeated the new science of international relations after World War I—epitomized by Woodrow Wilson and his Fourteen Points—stressed that liberal democratic institutions pursuing enlightened self-interest through international trade would lead to a lasting peace (Oneal and Russett, 1999). This was terribly shaken by the rise of fascism and World War II. In the wake of war, the ideas of Carr and Morgenthau stressed the need for a real, non-utopian re-assessment of international politics. Could it be that given the failures of neoliberalism the pendulum is swinging back to neorealism?

…Towards Neorealist Environmentalism?

Neorealism is the "systemization" of realism into a predictive science (Nye, 1988: 241), particularly in the work of Waltz (1979). As Legro and Moravcsik (1999) summarize, this realist project grounds itself on three main assumptions: (i) that the primary actors are rational, unitary states in anarchy, (ii) that state interests are fixed while goals are conflictual and (iii) that the structure of the international system is based on the primacy of material capabilities. The second assumption is perhaps the most important as it is derived from the other two: in anarchy there is no overarching authority to prevent others from using violence and thus *state survival* depends on one's position relative to the material capabilities of other states (Grieco, 1988: 497-498). For

realists, survival is the "core interest" of states. Realists argue that states are consequently skeptical of international institutions because states recognize that "today's friend may be tomorrow's enemy in war, and fear that achievements of joint gains that advantage a friend in the present might produce a more dangerous potential foe in the future" (Grieco, 1988: 487).

Neoliberalism itself only emerged as a concept in the 1980s as something of a bridge between realism and liberalism: a "neoliberal" systemic theory that moves towards a synthesis of Realism and Liberalism (Nye, 1988: 251). Indeed, neoliberalism and neorealism share an important number of basic assumptions—in particular, the dominance of state actors motivated by rational self-interest as well as the anarchy of the international system (Waever, 1996; Wendt, 1992). The difference is that neoliberalism emphasizes that despite these assumptions, international institutions can still facilitate cooperation between states:

> *The ability to communicate and cooperate can provide opportunities for the redefinition of interests and for the pursuit of strategies that would not be feasible in a world where the only information available to states was about other states' preferences and the power resources at their disposal. Just as allowing players of Prisoners' Dilemma to communicate with one another alters the nature of the game, so also institutions that increase the capability of states to communicate and to reach mutually beneficial agreements can add to the common grammar of statecraft and thus alter the results that ensue (Keohane and Nye, 1987: 746).*

But for neorealists, such cooperation is much more risky because anarchy prevents any real trust to be established.

Because of this, most studies of international environmental politics have tended to over-emphasize the different shades of multilateral environmentalism in international politics where convergence is observable and thereby have over-looked neorealism's influence. Regimes are associated with multilateralism—in either informal institutions or formal organizations. This is a shortcoming of regime analysis that Strange identified two decades ago:

> *[Regime analysis] encourages academics to practice a kind of analytical* chiaroscuro *that leaves in shadow all the aspects of the international economy where no regime exist and where each state elects to go its own way, while highlighting the areas of agreement where some norms and customs are generally acknowledged…The reality is that there are more areas and issues of non-agreement and controversy than there are areas of agreement (Strange, 1983: 349).*

Because neorealism shuns multilateralism, little attention has been paid to the possibility of neorealist response to the environmental crisis. Environmentalists have assumed that once the uncertainty surrounding the science of climate change was removed—as has been since 2007 IPCC Fourth Assessment Report stated that the science of climate change is "unequivocal" (IPCC, 2007: 5)—so-called climate skeptics would be compelled to embrace Kyoto-style action. This profoundly misinterprets the neorealist position.

A New Typology for International Environmental Politics

Having described neorealist environmentalism, I propose a new typology based on the degree of international cooperation each political theory espouses in order to interpret the current climate change debate. From Left to Right these would be: (i) Social Greens, (ii) Strong Neoliberal Environmentalists (Kyotophiles), (iii) Weak Neoliberal Environmentalists (Kyoto Skeptics) and (iv) Climate Realists. In what follows I sketch out the position of Climate Realists and compare its criticisms of the Kyoto Protocol with Kyoto Skeptics on the Right and Social Greens on the Left.

Climate Realists

If we understand neorealism as the prioritizing of state survival and a distrust of international institutions, this helps explain the lack of support for the Kyoto Protocol amongst conservative governments in the US, Canada and (until recently) Australia and points to the emergence of Climate Realists as a distinct environmental worldview. As issues of international environmental politics such as climate change become politically more salient, neorealists are expected to become more engaged for reasons both of cynical power calculation as well as of conceptual linkage to traditional neorealist interests such as security. But instead of moving towards a multilateral strategy for emission reductions, they are more likely to do just the opposite—focus on domestic adaptation in an attempt to weather the storm. Here economic growth remains the best means of coping with global environmental disaster. For Climate Realists, it is business-as-usual-despite-environmental-catastrophe: a shift from growth for gain to growth for survival. A few examples are necessary to sketch out this political philosophy.

First, consider the Bush Administration's initial antidote to the Kyoto Protocol: the Asia-Pacific Partnership on Clean Development and Climate (now largely morphed into the Major Emitters Process). The partnership is anticipated to mitigate cumulatively 90,000 $MtCO_2$ in the 2006 – 2050 period (Fisher et al., 2006: 3). However, the Fourth IPCC Assessment Report states that stabilization of the concentration of atmospheric CO_2 at 450 ppm—a condition necessary to prevent serious climate change[2]— require that cumulative emissions be reduced this century from an average of approximately 2,460,000 MtCO2 to approximately 1,800 $MtCO_2$: a difference of 660,000 MtCO2 (IPCC, 2007: 16). While noting that the two estimates are for different periods (50 years for Asia-Pacific, 100 years for IPCC), the difference is striking—the estimated impact of Asia-Pacific is an order of magnitude below the reductions called for by the IPCC. The Asia-Pacific partnership will lead to less than is required globally, but perhaps sufficient enough to bring climate change impact to a manageable level for industrialized countries.

But it may be said, even the Bush Administration's response has some vestige of climate change skepticism as well as international, albeit voluntary cooperation. Are there any climate neorealist politicians amongst us? Perhaps the only head of state to explicitly articulate a neorealist climate change position is Václav Klaus, current president of the Czech Republic. Having led the Czech Republic through its transition period from communism, climate change has become a recent focus (Klaus, 2007b). In a speech to the conservative US Council for National Policy entitled "What is Endangered: Climate or Freedom?" Klaus states that "Talking about communism, talking about europeanism and talking about environmentalism is more or less, structurally, similar if not identical. The issue is always freedom and its enemies" (Klaus, 2007d). Mitigation is dismissed as unrealistic and the regulations to enforce it reminiscent of communist totalitarianism:

> *Mankind has already accumulated tragic experience with one very proud intellectual stream that claimed that it knew how to manage society better [than] spontaneous market forces. It was communism and it failed, leaving behind millions of victims. Now, a new -ism has emerged that claims to be able to manage even nature and, through it, people (Klaus, 2007a).*

[2] The concentration of 450 ppm is key. For achieving the 2 degrees C target with a probability of more than 60%, greenhouse gas concentrations need to be stabilized at 450 ppm CO2-equivalent or below, if the 90% uncertainty range for climate sensitivity is believed to be 1.5-4.5 degrees C (den Elzen and Meinshausen, 2006). For increases in global average temperature exceeding 1.5-2.5°C and in concomitant atmospheric carbon dioxide concentrations, there are projected to be major changes in ecosystem structure and function, species' ecological interactions, and species' geographical ranges, with predominantly negative consequences for biodiversity, and ecosystem goods and services e.g., water and food supply (IPCC, 2007b: 11).

But this is not to say that neorealists believe climate change is not real:

> *Policies should realistically evaluate the potential our civilization has, as compared with the power of natural forces influencing climate…If we accept global warming as a real phenomenon, I believe we should address it in an absolutely different way. Instead of hopeless attempts to fight it, we should prepare ourselves for its consequences (Klaus, 2007a).*

And there's the rub—the prescription to weather the storm is further economic growth: "Economic growth is the solution to environmental problems, not their cause" (Klaus, 2007c). Growth is the answer, particularly in the climate change debate, because future economic growth assures poor countries will have the income to deal with climate change when it does reach crisis mode—50 years into the future. Recall that there is an important time-lag involved in climate change such that emission reductions we make now, particularly for CO_2 which has a long atmospheric lifetime, will not have an effect until well into the future (Meehl et al., 2007: 824-825).

While Klaus is perhaps the first politician to make the explicit argument that economic growth is more important for surviving environmental degradation than costly mitigation efforts, he finds support in the work of a number of prominent academics. The argument is a key claim of Bjorn Lomborg (aka "The Skeptical Environmentalist"). In his latest book he writes "When we try to help the developing world by cutting our carbon emissions, we are trying to help people far into the future, where they will be much richer" (Lomborg, 2007: 48). That is, future economic growth will give those who are now desperately poor—and thus potential victims of climate change—the capacity to adapt. They will be richer and thus able to buy their way out of any future climate crisis. In his discussion of the effect of discounting, Schelling makes a similar claim:

> *An initial interest in climate and its impact on welfare should not insulate one from alterative means to the same end. That then means that no framework for considering the benefits and costs of greenhouse gas abatement should isolate itself from the opportunity cost: direct investment in the economic improvement of the undeveloped countries. Abatement expenditures should have to compete with alternative ways of raising consumption utility in the developing world (Schelling, 2000: 836).*

In this way we can understand Lomborg's global priority list, the fruit of an exercise with experts, global leaders and youth (Lomborg, 2007: 43). He takes delight in noting that the Kyoto Protocol has consistently been ranked well towards the bottom of the list, well after other international development projects such as HIV/AIDS, malnutrition and sanitation.

Kyoto Skeptics

Similar to Climate Realists, Kyoto Skeptics repeatedly call for a more "real" response to climate change and question the capacity of an international institution such as the UN to coordinate a completely new carbon market. But this is instead an unfortunate consequence of the Kyoto Protocol's fundamental architecture. The main problem with the Kyoto Protocol is its emission reduction targets. Climate change is too complex a problem—a "wicked" problem in the terminology of Prins & Rayner (2007b: 13-14)—to be solved through a strict, comprehensive regulatory process steeped in targets and timetables. Such an approach is inappropriate because hard targets require the management of global GHG emissions, which are too poorly understood to be effectively managed through "output target-setting," which resemble "the failure of central planning in the now vanishing communist world" (Prins and Rayner, 2007b: 8-9). The response to the uncertainty surrounding the cost of mitigation strategies necessitated emissions trading as an escape mechanism: "Emission targets beget trading" (Victor, 2001: 11).

This necessitated the elaboration of what Victor (2001: 8-10) has called three "dead ends" to ease compliance with the Kyoto targets. These are the use of sinks, the purchase of carbon offsets from projects initiated in developing and transition countries (CDM and JI, respectively) and the purchase of carbon allowances from other developed countries (emissions trading). As a result, Kyoto has become more an exercise in emission accounting—and associated creation of emission loopholes such as forest sinks—which direct attention and resources away from meaningful mitigation or adaptation approaches. Instead, Kyoto Skeptics suggest lifting the "taboo" on climate change adaptation and promoting

> *a series of policies intended to build resilience against climate turbulence into all the day-to-day dimensions of society. These need not be primarily, or even solely, directed at climate stabilisation. Instead they would be intended to achieve that goal through the accumulation of contingent benefits. They would be aimed to work in the world as it is, rather than being predicated upon changing the world first so that it fits the policy (Prins and Rayner, 2007b: 27).*

Writing in 2000-2001, when the Kyoto climate change regime verged on collapse, Victor (2001: 11) predicted the demise of the Kyoto Protocol as a result of disagreement on the institutional structure of the carbon market :"[diplomats] know that agreement in Kyoto was possible only because negotiators left in the shadow the rules that would govern their imaginary emission trading system. Attempts to clarify and fix these rules will provoke deep disagreements and accelerate Kyoto's collapse." The rules for emissions trading were indeed not agreed upon in Kyoto but left to later negotiation. And here Victor's prediction almost came true. COP6 in 2000 at the Hague which was suspended after agreement failed over the operational modalities of the Kyoto Protocol, a division that had to do with the use of both domestic and international forest sinks (Doelle, 2005: 43-48; Wirth, 2002). This was followed by the Bush Administration's withdrawal from the Kyoto Protocol in March 2001. So was Victor right?

Here we should pause and ask, did the climate change regime unravel because of debate on emissions trading? First of all, there is disagreement on what the "collapse" of the climate change regime means. If the US withdrawal—the world's largest emitter (though soon to be eclipsed by China)—means collapse, then Victor is correct. But many of those outside the US might take exception to this claim. The architects of Kyoto were skilful enough to require that the Kyoto Protocol could survive the rejection of at least one major emitter, but not two. Russia's ratification—in exchange for EU support for its WTO bid—assured that enough countries (and emissions) were included for the Kyoto Protocol to come into force. As Eckersley (2007) has argued, the effect of Bush' repudiation had just the opposite effect and galvanized Kyoto support. Kyoto has been legitimized as an appropriate response despite its ineffectiveness. But as Eckersely also notes, the Kyoto Protocol's "legitimacy honeymoon" cannot last forever. In other words, Victor was wrong about the collapse of the Kyoto Protocol but right that we would see continued disagreement over emissions trading, disagreement that is only becoming more salient as the consequences of climate change become a reality.

Social Greens

Social Greens share many of the same critiques of the Kyoto Protocol as Kyoto Skeptics, but for quite different reasons. They possess a deep distrust of global capitalism, particularly the laissez-faire neoliberalism that has dominated until recently. In the climate change debate, this has emerged as the near universal condemnation of neoliberal carbon trading mechanisms:

> *Pollution trading is a completely new idea, recently pushed on the world by a small circle of neoliberal institutions in the US. (The quarrel between George W. Bush and carbon trading advocates such as the framers of the Kyoto Protocol is in part merely a friendly dispute between two overlapping factions of US*

> *business.) Pollution trading's main appeal is that it promises to save money for the rich over the short term. As a pollution control policy, it has a bad to indifferent record in the very few places it's been tried, and is sure to fail elsewhere if the pollutant involved is that slippery, ubiquitous compound called carbon dioxide (Lohmann, 2006: 329-330).*

The Left regards Kyoto as only another stage of capitalism leading to the global commodification of nature, a process which only further entrenches global inequality and social injustice (Castree, 2003; Lohmann, 2006).

Ultimately, their criticism of the CDM owes much of its intellectual pedigree to classical dependency theory of the 1960s-70s, which regarded the North as *exploiting* the South (Cardoso and Faletto, 1979 [1969]; Wallerstein, 1979). While beyond the scope of our current paper, it is important to note that nearly 25 years later Cardoso would warn instead, not of exploitation, but the advent of a "Fourth World" that "will not even be considered worth the trouble of exploitation, they will become inconsequential, of no interest to the developing globalized economy" (Cardoso, 1993: 156). Risk today may not be exploitation but the *marginalization* within the global economy noted by Kiely (1999: 35-36). The Social Green ontology is unable to fathom neorealist disengagement from a climate changed world, something which could be much worse than the tendency of green capitalists to seek cheap carbon credits from the developing world.

The debate on forest carbon sinks is worth revisiting in light of the position of Social Greens. Sinks were controversial particularly as credits gained from payment to reduce deforestation in developing countries under the CDM (Fearnside, 2001). Representing nearly 20% of global emissions (Niles, 2002), the potential of avoided deforestation to generate emission reduction is huge. But so large and cheap were the credits expected from reducing deforestation, it was anticipated to suppress the price of carbon credits by as much as 62% (Jung, 2003: 16-17) and would also divert resources away from CDM energy projects during the first commitment period of the Kyoto Protocol (Jung, 2005: 94). Ostensibly, the reason that forests were restricted in the CDM was because they did not lead to a reduction in fossil fuel consumption: "The question of whether the CDM is promoting sustainable development can be framed primarily in terms of whether it is promoting renewables in developing countries and thus assisting in the transition away from fossil fuels" (Pearson, 2007: 247, also see Lohmann 2000 & 2005). But how do these arguments stand when we are seeing increased support for the CCS technologies described earlier or, increasingly, carbon capture from air technologies which mimic in many ways the function of trees (Keith et al., 2006)?

Reassessing Climate Realism

Having sketched the main positions of three environmental worldviews critical of the current climate change regime, I identify problematic assumptions common to them all. It may be that while Climate Realists might be realistic about the impacts of climate change mitigation policy, they are idealistic about the impacts of business-as-usual growth and the prospects of international aid. This leads me to suggest that these neorealist assumptions are actually supported by the criticisms of the Kyoto Protocol made by Kyoto Skeptics and Social Greens, which prompts a reassessment of the carbon market.

Questioning Economic Growth and International Aid

Climate Realists make two problematic but inter-related assumptions about economic growth and international aid. First, from an economic perspective, Climate Realists base their claims of economic growth on a rather idealistic notion of the effect of growth on international development. From an economic perspective, the claim that future economic growth is the solution for climate change adaptation is valid only insofar growth per capita is even. Lomborg

and Schelling assume this: "the hoped-for uniformly (not uniform) positive growth in [gross] domestic product (GDP) per capita everywhere" (Schelling, 2000: 835). But the basis of this assumption may be more a result of the statistics used to project future growth. In effect, the claim that a rising business-as-usual tide lifts all boats has been challenged. Even neoliberal institutions such as the World Bank have suggested that the effects of economic growth might contribute to greater inequality (Ravallion, 2001; World Bank, 2005).

The optimistic projections of many economists might actually be based on a statistical artefact about the impact of economic growth. Until relatively recently however, studies have implied a decline since World War II in global inequality (Bhalla, 2002; Firebaugh, 2003). But such measures, based on population-weighted GDP per capita data, are better described as measures of *international* inequality because they only capture variation between countries. New data assembled by the World Bank and based on a global sample of individual household surveys (Milanovic, 2005) has allowed for the direct measurement of income inequality *within* and between countries—global inequality, as if national borders were not there. While these data are limited, results suggest that while inequality is declining between states, it is much higher and stable—if not rising—within states (Figure 1).

Secondly, the arguments about the international and intergenerational redistribution resulting from climate change mitigation policy which Climate Realists use beg an important political question: are major emitting countries concerned about climate change because of its effect on the developing world, either the contemporary or future one? A realist would say, not unless it is in their interest to do so. Is it not more *realistic* to consider that if industrialized states intend on combating global warming, they are doing so to protect themselves rather than the developing world? Returning to Lomborg's global priority list referred to earlier, it seems inappropriate to compare climate change mitigation policy—which is more easily framed to be in the self-interest of states—to international development policy. A better comparison might be made between international development and climate change adaptation policies, which are increasingly converging—an issue to which we shall return.

Reassessing the Carbon Market

If business-as-usual economic growth and international aid is questionable, we might want to re-assess the carbon market from the perspective of climate change mitigation and adaptation. Is the global carbon market floundering as Kyoto Skeptics and Social Greens suggest? Following the World Bank, I distinguish between the allowance-based ("hot air") and project-based offset markets (CDM/JI) under the Kyoto Protocol. The allowance-based market is certainly larger, being led by the EU Emission Trading Scheme (EU ETS). In 2007 it totalled of 2,061 $MtCO_2e$ of exchange, nearly doubling 2006 levels (Capoor and Ambrosi, 2008: 7). Add on to this the undisclosed volume of allowance-based credits Japan and (possibly) Canada intend on purchasing, and we have a very large demand in the allowance-based market. The Kyoto project-based offset market is dominated by the CDM however, with 2007 exchanges on the primary market at 551 $MtCO_2e$ (Capoor and Ambrosi, 2008: 7).

The allowance-based market has been criticized for reasons already described: it is prone to be swamped by "hot air" allowances from Russia and other former communist countries whose emissions plummeted well below their 1990 levels, still then the heyday of communism (at least in terms of emissions). There are good reasons to be concerned if all such credits come from such sources as there is no way to guarantee that emissions in these countries will remain low (see Simpson et al., 2007). But such an approach may have been justified as an incentive to attract the participation of Russia and other economies in transition.

More hope has been placed in the CDM which seeks to generate credits from projects that result in actual emission reductions. As a result of its dominance in the offset market, most attention has focused on the CDM. We see here three main criticisms of the CDM emerging: (i) it is inefficient, (ii) it cannot be known with certainty that CDM projects are "additional" and really

lead to climate change mitigation and (iii) it does not contribute to sustainable development. I assess these claims by analyzing the "CDM Pipeline" dataset maintained by the UNEP-Risoe Centre (UNEP Risoe Centre, 2006). The UNEP-Risoe Centre compiles freely-available CDM project data from the UNFCCC web-page.[3] Important here is that there are projects at various stages of the CDM administrative cycle: the pipeline includes CDM projects from the validation stage (project documents submitted for third party validation and start of the 30 days public comment period) and registration. In my general analysis of the CDM pipeline, I have combined projects "at validation", "pending validation" and "registered." This is justified as the CDM Executive Board has been plagued by administrative obstacles that have prevented it from registering CDM projects at the rate that they are requested (Ecosecurities, 2007). Note however that projects at a stage before validation are not included in the UNEP-Risoe Centre pipeline.

An Inefficient Carbon Market?

One of condemnations of the CDM is that it is an inefficient vehicle for reducing greenhouse gases. The evidence for this comes from the HFC destruction market. HFCs are a much more potent strain of greenhouse gas than CO_2, so under the Kyoto Protocol HFCs can be sold as equivalent of nearly 12,000 tonnes of CO_2 (Lee, 2004: 61). Savvy carbon investors and cooperative host governments have made a windfall exploiting these returns, and HFC projects have dominated the early stages of the CDM market. Kyoto skeptics have been quick to point this out. Prins and Rayner exclaim:

> *Such fabricated markets invite sharp and corrupt practices–and these are now occurring on a large scale in the European Emissions Trading Scheme and through Kyoto Clean Development Mechanism scams such as HFC combustion. This accounts for two-thirds of all CDM payments to 2012. On false premises, it dodged increasing challenges that result from industrialisation in China and India, in particular the growing use of coal in both countries (Prins and Rayner, 2007b: 30).*

While not as bombastic, Wara notes that HFCs comprise "almost 30% of the entire market" (Wara, 2007: 595). Kyoto skeptics find this a perverse market because it is an inefficient way to eliminate HFCs. Wara points out that low-cost technology already exists to destroy HFCs at a fraction of the CDM cost: $31 million versus the $800 million paid through the CDM (Wara, 2007: 595). A more cost effective approach would be to create a separate agreement specifically to target the elimination of HFCs by developed countries pay for low-cost technology, rather than relying on the inflated market price (Victor, 2007)

There are two responses to be made to these criticisms. First, the CDM market is changing. Though in 2004 such projects only comprised 17% of the CDM credits through to 2012, they now constitute nearly half (
Figure 2 & 3). More importantly, the total share of HFC projects has dropped from 45% of the CDM in 2004 to 21% in 2007. Similar results are obtained when we limit our analysis to only registered CDM projects. This suggests that new projects added to the CDM pipeline are consistently those that reduce CO_2 emissions. What the critics of the CDM refer to above has only been a snap-shot of the carbon market.

Secondly, as they say, hindsight is always 20/20. The degree to which the CDM is economically inefficient can only be known *post-hoc*, after the price for carbon has been determined.[4] While Weitzman (1974) notes there is no economic reason to favour price controls

[3] http://cdm.unfccc.int/Projects/projsearch.html

[4] Prices for allowances ("hot air") in EU-ETS have to current prices US $35/tCO2e, significantly greater than compliant offset prices through the CDM (CERs). Recent prices suggest that CDM credits range for US $16-$22/tCO2e on the primary markets and US $25 on the secondary market. The spread between CER

over emission targets as a strategy for regulating pollution, the architects of Kyoto faced an even more fundamental level uncertainty—the actual extent of emissions. Hence Kyoto targets are based on a relative value (in relation to 1990 emission levels) and only requiring a modest reduction below this level in the first commitment period (2008-2012). No one really knew how much this would be and much of the work undertaken by Kyoto has been with regard to emission accounting: "you manage what you measure" (Lowenstein, 1996). Given this level of uncertainty, it seems understandable why the quota approach was adopted in Kyoto.

"Additionality" and Climate Change Mitigation

As Wara and Victor point out, if the CDM reductions are genuine, "then the CDM would be the largest source of GHG reductions produced by the Kyoto Protocol" (Wara and Victor, 2008: 8). How much an impact might the CDM have? Uncertainties about the future path of GHGs in industrialized countries and the post-hoc determination of CDM project impacts make this assessment difficult. But we can gain some understanding through a counterfactual projecting anticipated CDM emission reductions through to 2012 from the over 3,000 projects in the pipeline against emission data collected under the UNFCCC. While emissions data only extend to 2005 they are indicative of general trends. Figure 4 demonstrates the impact of the CDM on emissions of Kyoto parties, if we pretend that CDM reductions through to 2012 were available by 2005—as if the CDM had been implemented seven years earlier. What we see here is that use of the CDM would almost bring industrialized countries within their Kyoto target. While 2012 emissions from industrialized countries will almost certainly be greater than in 2005, the magnitude of the anticipated mitigation of the CDM is not trivial.

But this is impact is valid only if the CDM reductions are additional. The more damning criticisms of the CDM come from Kyoto Skeptics and Social Greens who point to the impossibility of establishing the "additionality" of CDM projects. CDM projects are to generate GHG emission reduction credits only if the reductions are additional to any that would have occurred in the absence of the certified project activity. This business-as-usual baseline becomes a defacto counterfactual, which is open to manipulation and "gaming":

> *As long as the company's consultants can rhetorically eliminate these possible other 'futures' in favour of the single counterfactual scenario represented by the coal-fired plant, it can be licensed to continue [the] transfer of carbon to the atmosphere above its own power stations. The claim that alternative low-carbon or non-carbon futures do not exist becomes a way of dumping carbon in those futures (Lohmann, 2005: 209).*

…and elsewhere…

> *These so-called offsets are likely to appear quite cheap, but that is in part because payments are being made to people or companies for actions they were already planning, in many cases (Simpson et al., 2007: 194)*

Wara and Victor present evidence that the CDM increasingly includes business-as-usual practices (Wara and Victor, 2008). They point to China where *all* new hydro, wind and natural gas fired capacity is seeking credit, which is clearly untenable: "these individual applications amount to a claim that [these elements] of the power sector in China would not be growing at all without help from the CDM" (Wara and Victor, 2008: 14). But as they state, this situation is largely due to the

---

and allowances thus is about US $8.75/tCO2e. Goto: http://www.reutersinteractive.com/CarbonPrices (accessed February 15, 2008). Note however that the above CDM prices do not reflect the impact of reforestation projects; unlike other CDM credits these have been prohibited from entering the EU-ETS because of issues of permanence issues. Credits from CDM reforestation projects (60 year l-CERs or 5 year t-CERs) are much cheaper, US $2-$5/tCO2e.

volume of individual projects the CDM Executive Board is intended to administer, with endemic information asymmetries as well as a misalignment of interests between project developers and project third party validators.

This critique is not necessarily new, as practitioners have admitted the problem of ensuring additionality repeatedly (see note 270 in Lohmann, 2006: 210). The question is, can it be managed? Victor and Wara point to one potential solution: programmatic CDM. This was initially proposed at the 2005 UN Climate Change Conference in Montreal as a strategy to contain transaction costs. This strategy is to permit bundling of project activities, though removing limitations on project size and correspondingly stream-lined small-scale methodologies (Ellis, 2006). If applied to a national power sector, Wara and Victor suggest it could help resolve some of the information asymmetries. But additionality can also be ensured by the liability rules surrounding generating CDM credits over the time period of the CDM project cycle. Recall that credits are only formally issued for sale *after* the monitoring period has come to a close, not before. At least in theory (as many of the monitoring periods are currently underway), the CDM Executive Board could *post-hoc* compare the business-as-usual baseline proposed at project inception to what actually transpired. If the CDM were to institutionalize buyer-liability, this could increase the scrutiny of projects by country buyers (Brunnée, 2003: 16).

Little Contribution to Sustainable Development

The last criticism of the CDM comes with regard to its impacts on sustainable development, the purported second goal of the CDM. Current investment flows to developing countries under the CDM continue to imitate business-as-usual capital flows which overlook some of the least developed parts of the world, particularly sub-Saharan Africa (Capoor and Ambrosi, 2007; Cosbey et al., 2005; UNDP, 2006). Partially in recognition of this problem, many aid programs have responded by funding capacity-building for CDM implementation in less developed countries. The most prominent is the Nairobi Framework initiated at COP/MOP2 in 2006 and led by the United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP), World Bank Group (WBG), African Development Bank (AfDB) and the United Nations Framework Convention on Climate Change (UNFCCC) with the specific goal of helping developing countries, especially those in Sub-Saharan Africa, improve their level of participation in the CDM, with a budget for Phase I activities estimated at US $4.5 million (UNFCCC, 2007). Perhaps as a result of these efforts, the expected contribution of Sub-Saharan Africa to the CDM is no longer insignificant (Figure 5), though **much** work remains to be done. Furthermore, as a low emitter of GHGs, Sub-Saharan Africa stands to gain from increased inclusion of land-use change and forestry projects in the CDM. In Sub-Saharan Africa, fuelwood accounts for between 61-86% of primary energy consumption, mostly at the household level (Amous, 1999) and in many areas fuelwood demand is expected to exceed supply (for example, Drigo, 2005). Such projects have been excluded from the CDM until very recently (Schlamadinger et al., 2007).

But isn't the CDM supposed to result in financing for CDM projects that is additional to ODA? Michaelowa and Michaelowa (2007) find that since the 2004 OECD decision to allow indirect ODA support for the CDM (OECD/DAC, 2004), such a diversion has increasingly occurred. In addition, these authors note conflicting priorities between climate change and development. For example, one of the earliest reforestation CDM projects—the Plantar project in Brazil, a large-scale Eucalyptus plantation established in a traditionally savanna biome—has attracted a good deal of attention for its negative impacts on local communities and ecosystems (Lohmann, 2005; World Rainforest Movement, 2002). These divergent interests have prompted a number of Kyoto Skeptics to argue that engagement with the developing world as well as adaptation needs to be addressed through a separate financing mechanism (Prins and Rayner,

2007b; Wara and Victor, 2008), something that the UNFCCC has endorsed itself (UNFCCC, 2007: 196).

But where is the extra financing for climate change adaptation to come from? It is estimated that an "additional" $28-86 billion is needed annually to help those in the developing world adapt to climate change (UNDP, 2007: 190 & 194; United Nations, 2007: Exec. Summary, para. 26). But international aid levels remain low: in 2006 ODA stood at $103.9 billion or approximately 0.3% of donor countries GNI (United Nations, 2007: 28-29), not even half of the 0.7% target re-affirmed in 2002 (United Nations, 2002: para. 42). To give this some perspective, calls for additional climate change adaptation—when added to the 2002 Monterrey pledge—would increase ODA contributions to a total of 0.78% to 0.94% of donor countries' GNI—nearly tripling current aid levels (See Figure 6). In order to raise such additional funds, alternative strategies have been recently been proposed by the UN, including an auction of international aviation and marine emissions allowances, international air travel levy and a Tobin tax on international currency exchange (UNFCCC, 2007: 196).

Are the "new and additional" funds necessary for international aid and adaptation realistic, in the political sense of the word? While ODA flows are less volatile than foreign direct investment (FDI) (Morrissey and Osei, 2004: 45), they have generally been of much lower volume than FDI, except in sub-Saharan Africa and South Asia. But in these two areas, this is because of the absence of FDI which makes ODA relatively more important. Morrissey (2006) concludes that while ODA is required to achieve a minimum economic governance structure, the real driver of economic success stories in East Asia and Latin America is FDI. While not to discount the calls for additional financing, it seems plausible then that the decision to permit indirect ODA contributions to the CDM market was a compromise.

Here it is worth recognizing that adaptation is not necessarily about building higher dykes or deploying extra mosquito nets. Rather, adaptation will be best served by giving people the tools to help themselves, particularly income. As UNDP has pointed out in its 2007 Human Development Report, adaptation should "[e]mpower and enable vulnerable people to adapt to climate change by building resilience through investments in social protection, health, education and other measures" which can be achieved by integrating "adaptation into poverty reduction strategies that address vulnerabilities linked to inequalities based on wealth, gender, location and other markers for disadvantage" (UNDP, 2007: 18). In this way, adaptation becomes nearly synonymous with sustainable development.

Finally, contrary to the assertion that "the top-down creation of an artificial global market in greenhouse gases seems extraordinary" (Prins and Rayner, 2007b: 26), the carbon market would not be the first artificial commodity created through government intervention. Polanyi's history of capitalism suggests that modern markets have never spontaneously arisen, rather "fictitious commodities" have always been carved out by government intervention (Blythe, 2002; Polanyi, 2001 [1944]). Indeed, the very type of "bottom-up" approaches Prins and Rayner laud, such as the voluntary carbon offset market, are plagued by double-accounting and methodological issues so much that it has been suggested that the CDM model be applied (Gillenwater et al., 2007).

Conclusion

In reaching a conclusion on the future of the climate change regime, it is worth acknowledging that thhe criticisms of the CDM above have however not gone without a response. In terms of HFCs, the CDM Executive Board has responded by tightening the project eligibility criteria for HFC destruction projects, issuing guidelines only very recently (CDM EB, 2008a). In terms of additionality, the CDM Executive Board tabled rules on programmatic CDM already in 2007, before the latest criticisms on additionality came to light (CDM EB, 2008b). Tellingly, another motivation for programmatic CDM tools has been to facilitate the development of small-

scale projects, which currently face serious transaction cost hurdles in the CDM project cycle (Hinostroza et al., 2007). These responses demonstrate a tremendous amount of institutional learning has occurred in the short time that the CDM has been in operation.

While far from perfect, neoliberal international market-based environmental approaches have certain advantages for achieving *both* climate change mitigation and adaptation goals by harnessing self-interest, a keystone of liberalism since Locke (Goldwin, 1987 [1963]). Soliciting the extra financing necessary for international development and adaptation might only realistically be possible through a market mechanism. Pending a revolution in global norms with regard to the plight of those living in developing countries, at this stage in the game it seems inappropriate to abandon ship and focus on other routes to address climate change policy. International commitment for international climate change adaptation is not yet forthcoming.

This is not to deny that such a revolution in global norms is possible—the policy response to climate change is what we make of it. But calls for extra financing for adaptation need not be at odds with the continued maintenance of the CDM as the premier international carbon offset market. Those who claim to be "realistic" about the international carbon market may, ironically, be more idealistic about other sources of financing for international development. If abandoned, are we sure the CDM will be replaced? Or might this lead to a political vacuum representing political disengagment with the developing world that could precipitate the unravelling of the neoliberal environmnental regime? While a neorealist response to climate change is unlikely, the issues at stake warrant a compromise approach.

Bibliography

Amous, S. (1999). *The Role of Wood Energy in Africa: wood energy today for tomorrow*. Rome: FAO, Forestry Department.

Azar, G. (2007). The Return of Authoritarian Great Powers. *Foreign Affairs, 86*, 59-+.

Bhalla, S. (2002). *Imagine There Is No Country*. Washington, DC: Institute for International Economics.

Blythe, M. (2002). *Great Transformations: economic ideas and institutional change in the Twenthieth Century*. Cambridge: Cambridge University Press.

Brunnée, J. (2003). The Kyoto Protocol: testing ground for compliance theories? *Zeitschrift für ausländisches öffentliches Recht und Völkerrecht - Heidelberg Journal of International Law, 63*, 255.

Capoor, K. and Ambrosi, P. (2007). *State and Trends of the Carbon Market 2007*. Washington DC: International Emissions Trading Association (IETA) and World Bank Carbon Finance.

Capoor, K. and Ambrosi, P. (2008). *State and Trends of the Carbon Market 2008*. Washington DC: International Emissions Trading Association (IETA) and World Bank Carbon Finance.

Cardoso, F. and Faletto, E. (1979 [1969]). *Dependency and Development in Latin America*. Berkeley: University of California Press.

Cardoso, F. H. (1993). North-South Relations in the Present Context: A New Dependency? In Castells M., Carnoy M., Cohen S. S. and Cardoso F. H. (Eds.), *The New Global Economy in the Information Age: reflections on our changing world*, (pp. 149-159). State College, PA: Penn State University Press.

Castree, N. (2003). Commodifying what nature? *Progress in Human Geography, 27*, 273-297.

CDM EB. (2008a). Annex 8: Guidance on Accounting Eligible HFC-23(Eds.), *Report of Executive Board of the Clean Development Mechanism, 20th Meeting (CDM-EB-39)*. Bonn, Germany: UNFCCC.

CDM EB. (2008b). Annex 8: Guidance on Accounting Eligible HFC-23(Eds.), *Report of Executive Board of the Clean Development Mechanism, 39th Meeting (CDM-EB-39)*. Bonn, Germany: UNFCCC.

Clapp, J. and Dauvergne, P. (2005). *Paths to a Green World: the political economy of the global environment*. Cambridge, MA: MIT Press.

Cosbey, A., Parry, J.-O., Browne, J., Babu, Y. D., Bhandari, P., Drexhage, J. and Murphy, D. (2005). *Realizing the Development Dividend: making the CDM work for developing countries*. Winnipeg: IISD.

Craig, D. (2006). *Development Beyond Neoliberalism?: governance, poverty reduction, and political economy*. New York: Routledge.

Dodge, D. and Murray, J. (2006). The Evolving International Monetary Order and the Need for an Evolving IMF. *Global Governance, 12*, 361-372.

Doelle, M. (2005). *From Hot Air to Action? Climate Change, Compliance and the Future of International Environmental Law*. Toronto: Thomson Carswell.

Drigo, R. (2005). *WISDOM – East Africa: Woodfuel Integrated Supply/Demand Overview Mapping (WISDOM) Methodology, Spatial woodfuel production and consumption analysis of selected African countries*. Rome: FAO.

Eckersley, R. (2007). Ambushed: the Kyoto Protocol, the Bush Administration's Climate Policy and the Erosion of Legitimacy. *International Politics, 44*, 306-324.

Ecosecurities. (2007). *EcoSecurities: CDM registration, issuance process has slowed significantly*. Berlin: www.CO2-handel.de. Website (accessed 20 May 2008): http://www.co2-handel.de/article160_7186.html.

Ellis, J. (2006). *Issues Related to Implementing "Programmatic CDM"*. Paris: OECD/IEA.

Fearnside, P. M. (2001). Saving tropical forests as a global warming countermeasure: an issue that divides the environmental movement. *Ecological Economics, 39*, 167-184.

Firebaugh, G. (2003). *The New Geography of Global Income Inequality*. Cambridge: Harvard University Press.

Fisher, B. S., Ford, M., Jakeman, G., Gurney, A., Penm, J., Matysek, A. and Gunasekera, D. (2006). *Technological Development and Economic Growth: Inaugral Ministerial Meeting of the Asia Pacific Partnership for Clean Development and Climate, ABARE Research Reprot 06.1*. Canberra: Australian Bureau of Agriculture and Resource Economics.

Gillenwater, M., Broekhoff, D., Trexler, M., Hyman, J. and Fowler, R. (2007). Policing the voluntary carbon market. *Nature Reports Climate Change, 6*, 85-87.

Goldwin, R. A. (1987 [1963]). Locke. In Straus L. and Cropsey J. (Eds.), *History of Political Philosophy*, (pp. 476-512). Chicago: University of Chicago Press.

Grieco, J. M. (1988). Anarchy and the limits of cooperation: a realist critique of the newest liberal institutionalism. *International Organization, 42*, 485-507.

Hinostroza, M., Cheng, C.-C., Zhu, X., Fenhann, J., Figueres, C. and Avendano, F. (2007). *Potentials and Barriers for End-Use Energy Efficiency Under Programmatic CDM*. Roskilde, Denmark: CD4CDM.

IPCC. (2007). Summary for Policymakers. In Solomon S., Qin D., Manning M., Chen Z., Marquis M., Averyt K. B., Tignor M. and Miller H. L. (Eds.), *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovermental Panel on Climate Change*. Cambridge: Cambridge University Press.

Jaccard, M. (2005). *Sustainable Fossil Fuels: the unusual suspect in the quest for clean and enduring energy*. Cambridge: Cambridge University Press.

Jung, M. (2003). The Role of Forestry Sinks in the CDM - analyzing the effects of policy decisions on the carbon market. *HWWA Discussion Paper, 241*.

Jung, M. (2005). The Role of Forestry Projects in the Clean Development Mechanism. *Environmental Science & Policy, 8*, 87-104.

Keith, D. W., Ha-Duong, M. and Stolaroff, J. K. (2006). Climate strategy with CO2 capture from the air. *Climatic Change, 74*, 17-45.

Keohane, R. and Nye, J. S. (1987). Power and Interdependence Revisited. *International Organization, 41*, 725-753.

Kiely, R. (1999). The Last Refuge of the Noble Savage? A critical assessment of post-development theory. *The European Journal of Development Research, 11*, 30-55.

Klaus, V. (2007a). *Answers to questions from the House of Representatives of the U.S. Congress, Committee on Energy and Commerce, on the issue of mankind's contribution to global warming and climate change*. Prague: VaclavKlaus.Cz. Website (accessed April 25, 2008): http://www.vaclavklaus.cz/klaus2/asp/clanek.asp?id=IgDUIjFzEXAz.

Klaus, V. (2007b). *Modrá, nikoli zelená planeta. Co je ohroženo: klima nebo svoboda?* Prague: Dokorán.

Klaus, V. (2007c). *Review: Blue Planet in Green Chains - What is Endangered: Climate or Freedom?* Vienna: Wien International. Website (accessed April 25, 2008): http://www.wieninternational.at/en/node/6081.

Klaus, V. (2007d). *What is Endangered: Climate or Freedom?* Prague: VaclavKlaus.Cz. Website (accessed October 15, 2007): http://www.klaus.cz/klaus2/asp/clanek.asp?id=pxJQbZiEtmMH.

Lee, M.-K. (Eds.). (2004). *CDM: Information and Guidebook*. Roskilde, Denmark: UNEP Riso Centre.

Legro, J. W. and Moravcsik, A. (1999). Is Anybody Still a Realist? *International Security, 24*, 5-55.

Lohmann, L. (2005). Marketing and Making Carbon Dumps: commodification, calculation and counterfactuals in climate change mitigation. *Science as Culture, 14*, 203-235.

Lohmann, L. (Eds.). (2006). *Carbon Trading - A Critical Conversation on Climate Change, Privatisation and Power*. Dorset: Dag Hammarskjold Foundation, Durban Group for Climate Justice and The Corner House.

Lomborg, B. (2007). *Cool It: the skeptical environmentalist's guide to global warming*. New York: Knopf Publishing Group.

Lowenstein, L. (1996). Financial transparency and corporate governance: you manage what you measure. *Columbia Law Review, 96*, 1335-1362.

Meehl, G. A., Stocker, T. F. and Co-Authors. (2007). Global climate projections. In Solomon S., Qin S., Manning M., Chen Z., Marquis M., Averyt K. B., Tignor M. and Miller H. L. (Eds.), *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth*

Assessment Report of the Intergovernmental Panel on Climate Change,, (pp. 747-846). Cambridge: Cambridge University Press.

Metz, B., Davidson, O. R., de Coninck, H., Loos, M. and Meyer, L. (Eds.). (2005). *IPCC Special Report on Carbon Dioxide Capture and Storage*. Cambridge, UK and NY: Cambridge University Press.

Michaelowa, A. and Michaelowa, K. (2007). Climate or development: is ODA diverted from its original purpose. *Climatic Change, 84*.

Milanovic, B. (2005). *Worlds Apart: measuring international and global inequality*. Princeton: Princeton University Press.

Morrissey, O. (2006). Aid or trade, or aid and trade? *Australian Economic Review, 39*, 78-88.

Morrissey, O. and Osei, R. (2004). Capital flows to developing countries: Trends, volatility and policy implications. *IDS Bulletin-Institute of Development Studies, 35*, 40-49.

Nieuwenhuys, E. C. (2006). *Neo-liberal globalism and social sustainable globalisation*. Leiden: Brill.

Niles, J. O. (2002). Tropical forests and climate change. In Schneider S. H., Rosencranz A. and Niles J. O. (Eds.), *Climate Change Policy: a survey*, (pp. 337-371). Washington, DC: Island Press.

Nye, J. S. (1988). Review: Neorealism and Neoliberalism. *World Politics, 40*, 235-251.

OECD/DAC. (2004). *ODA eligibility of expenditures under the clean development mechanism, DAC/CHAIR*

(2004)4/FINAL. Paris: OECD.

Oneal, J. R. and Russett, B. M. (1999). The Kantian Peace: the pacific benefits of democracy, interdependence, and international organizations, 1885-1992. *World Politics, 52*, 1-37.

Pauly, L. W. (2007). The United Nations in a changing global economy. In Bernstein S. and Pauly L. W. (Eds.), *Global Liberalism and Political Order: toward a new grand comprise?*, (pp. 91-108). Albany: SUNY Press.

Pearson, B. (2007). Market Failure: why the Clean Development Mechanism won't promote clean development. *Journal of Cleaner Production, 15*, 247-252.

Polanyi, K. (2001 [1944]). *The Great Transformation: the political and economic origins of our time*. Boston: Beacon Press.

Powell, F. (2007). *The Politics of Civil Society: neoliberalism or social left?* Bristol: Policy Press.

Prins, G. and Rayner, S. (2007a). Time to Ditch Kyoto. *Nature, 449*, 973-975.

Prins, G. and Rayner, S. (2007b). *The Wrong Trousers: radically rethinking climate policy*. Oxford: James Martin Institute for Science and Civilization.

Ravallion, M. (2001). Growth, inequality and poverty: looking beyond averages. *World Development, 29*, 1803–15.

Rodrik, D. (2006). Goodbye Washington consensus? Hello Washington confusion? a review of the World Bank's economic growth in the 1990s: learning from a decade of reform. *Journal of Economic Literature, 44*, 973-987.

Ruggie, J. G. (1982). International regimes, transactions, and change: embedded liberalism in the postwar economic order. *International Organization, 36*, 379-415.

Ruggie, J. G. (1992). Multilateralism: the anatomy of an institution. *International Organization, 46*, 561-598.

Ruggie, J. G. (2007). Global Markets and Global Governance: the prospects for convergence. In Bernstein S. and Pauly L. W. (Eds.), *Global Liberalism and Political Order: toward a new grand comprise?*, (pp. 23-48). Albany: SUNY Press.

Schelling, T. S. (2000). Intergeneration and international discounting. *Risk Analysis, 20*, 833-837.

Schellnhuber, J. (2007). Kyoto: no time to rearrange deckchairs on the Titanic. *Nature, 450*, 346.

Schlamadinger, B., Bird, N., Johns, T., Brown, S., Canadell, J., Ciccarese, L., Dutschke, M., Fiedler, J., Fischlin, A., Fearnside, P., Forner, C., Freibauer, A., Frumhoff, P., Hoehne, N., Kirschbaum, M. U. F., Labat, A., Marland, G., Michaelowa, A., Montanarella, L., Moutinho, P., Murdiyarso, D., Pena, N., Pingoud, K., Rakonczay, Z., Rametsteiner, E., Rock, J., Sanz, M. J., Schneider, U. A., Shuidenko, A., Skutsch, M., Smith, P., Somogyi, Z., Trines, E., Ward, M. and Yamagata, Y. (2007). A synopsis of land use, land-use change and forestry (LULUCF) under the Kyoto Protocol and Marrakech Accords. *Environmental Science & Policy, 10*, 271-282.

Simpson, J., Jaccard, M. and Rivers, N. (2007). *Hot Air: fixing Canada's climate change challenge*. Toronto: McClelland & Stewart.

Strange, S. (1983). *Cave! hic dragones*: a critique of regime analysis. In Krasner S. D. (Eds.), *International Regimes*, (pp. 337-354). Ithaca, NY: Cornell University Press.

Thérien, J.-N. (2007). The politics of international development: approaching a new grand compromise? In Bernstein S. and Pauly L. W. (Eds.), *Global Liberalism and Political Order: toward a new grand comprise?*, (pp. 71-89). Albany: SUNY Press.

UNDP. (2006). *CDM Monitoring Report*. New York: UNDP MDG Carbon Unit.

UNDP. (2007). *Human Development Report 2007/2008 - Fighting climate change: human solidarity in a divided world*. New York: UNDP.

UNEP Risoe Centre. (2006). *Guidance to the CDM/JI Pipeline, December 2006*. Roskilde, Denmark: UNEP-Risoe Centre. Website (accessed 1 May 2008): http://www.cdmpipeline.org/.

UNFCCC. (2007). *Nairobi Framework: Capacity for Carbon Market Development in Sub-Saharan Africa, An Inter-Agency Program Proposal*. Bonn, Germany: UNFCCC.

United Nations. (2002). Report of the International Conference on Financing for Development(Eds.), *UN doc: A/CONF.198/11*. New York: United Nations.

United Nations. (2007). *The Millennium Development Goals Report 2007*. New York: United Nations.

Victor, D. (2001). *The Collapse of the Kyoto Protocol and the Struggle to Slow Global Warming*. Princeton: Princeton University Press.

Victor, D. (2007). Making carbon markets work. *Scientific American, 297*, 70-77.

Waever, O. (1996). The Rise and Fall of the Inter-Paradigm Debate. In Smith S., Booth K. and Zalewski M. (Eds.), *International Theory: positivism and beyond*, (pp. 149-185). Cambridge: Cambridge University Press.

Wallerstein, R. (1979). *The Capitalist World Economy*. Cambridge: Cambridge University Press.

Waltz, K. (1979). *Theory of International Politics*. New York: Random House.

Wara, M. (2007). Is the global carbon market working? *Nature, 445*, 595-596.

Wara, M. and Victor, D. (2008). *A Realistic Policy on International Carbon Offsets, PSED Working Paper #74*. Stanford: Program on Energy and Sustainable Development, Stanford University.

Weitzman, M. L. (1974). Prices vs. Quantities. *The Review of Economic Studies, 41*, 477-491.

Wendt, A. (1992). Anarchy Is What States Make of It: the social construction of power-politics. *International Organization, 46*, 391-425.

Wilson, E. J., Morgan, M. G., Apt, J., Bonner, M., Bunting, C., Gode, J., Haszeldine, R. S., Jaeger, C. C., Keith, D. W., McCoy, S. T., Pollak, M. F., Reiner, D. M., Rubin, E. S., Torvanger, A., Ulardic, C., Vajjhala, S. P., Victor, D. and Wright, I. W. (2008). Regulatin the geological sequestration of CO2. *Environmental Science & Technology*, 2718-2722.

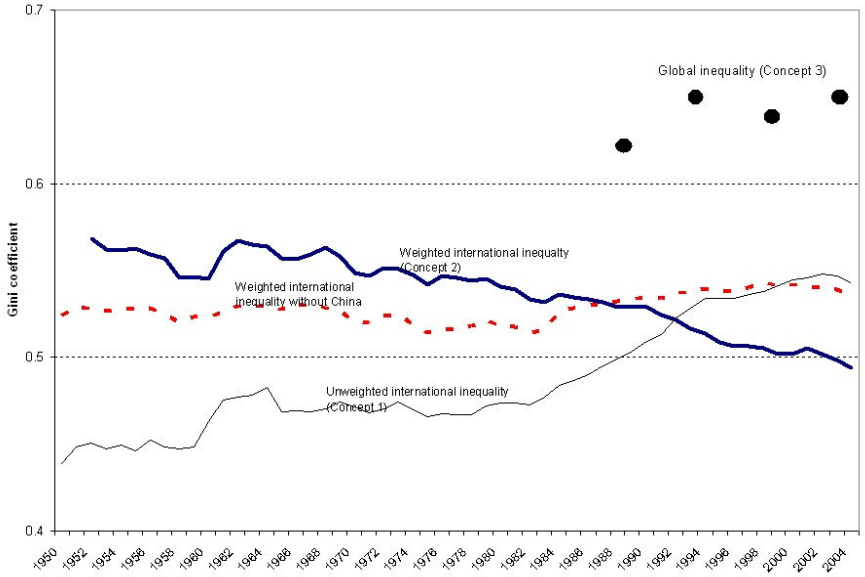
Wirth, D. A. (2002). The Sixth Session (Part Two) and Seventh Session of the Conference of the Parties to the Framework Convention on Climate Change. *American Journal of International Law, 96*, 648-660.

Woods, N. (2008). *From Intervention to Cooperation: reforming the IMF and World Bank*. London: Policy Network.

World Bank. (2005). *Economic Growth in the 1990s: learning from a decade of reform*. Washington, DC: World Bank.

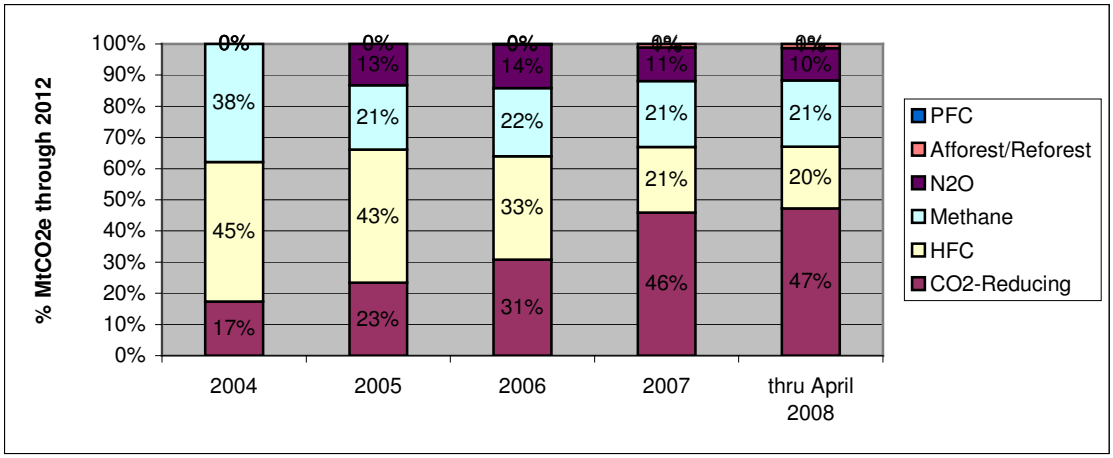
World Rainforest Movement. (2002). *Evaluation Report of V&M Florestal Ltda. and Plantar S.A. Reflorestamentos, both certified by FSC - Forest Stewardship Council*. Montevidea, Uruguay: World Rainforest Movement. Website (accessed August 12, 2005): http://www.wrm.org.uy/countries/Brazil/fsc.html.

Figure 1: Measures of Global and International Inequality[5]



The four black dots represent recent trends in global inequality (Concept 3 Inequality); the blue and red-dashed lines indicate weighted per capita international inequality, with and without China, respectively (Concept 2 Inequality); the grey line indicates international inequality without any compensation for population ("unweighted"), referred to by Milanovic as Concept 1 Inequality. See Milanovic (2005) for a detailed discription of these different concepts of inequality.

Figure 2: Changing Composition of CDM Pipeline, by Percent Credit Volume through to 2012 [6]



[5] Source: Milanovic (per. comm., 2007) based on data described in Milanovic (2005) with the addition of new, unpublished data for 2002 Global Inequality.

[6] Derived from UNEP-Risoe CDM pipeline data as described in text, based on cumulative percentage of credit volumes through to 2012 of projects "at validation," pending registration and registered.

Figure 3: Annual Distribution of CDM Credits through to 2012, by Project Type

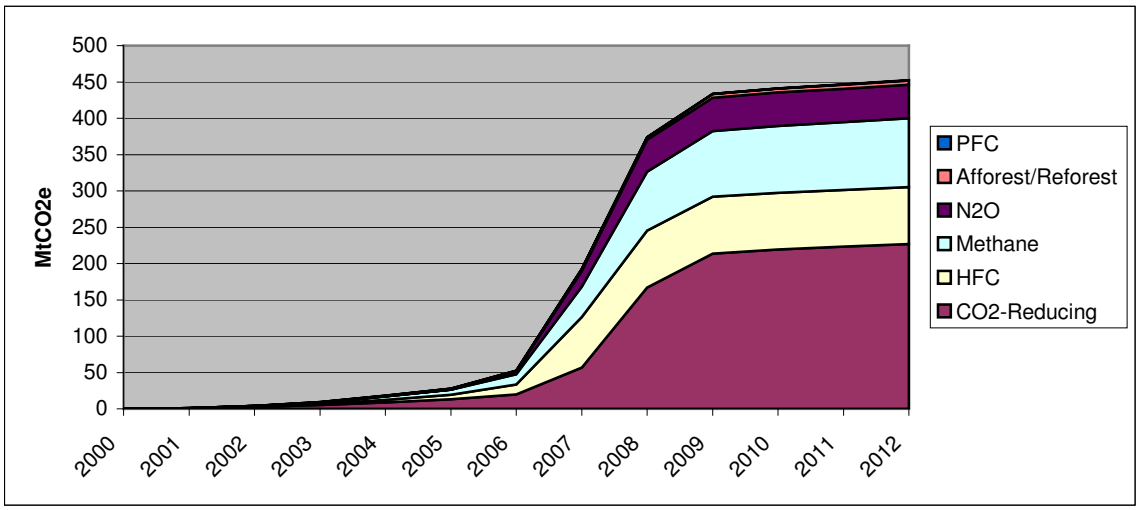
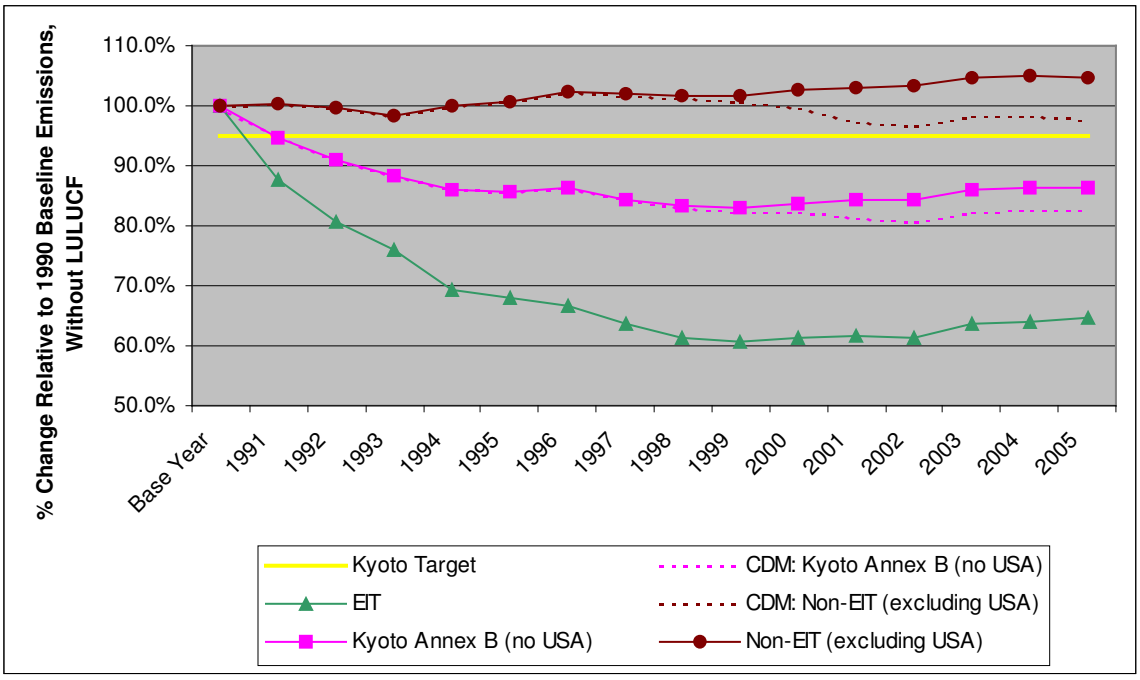


Figure 4: Hypothetical impact of CDM on the average emissions (without LULUCF) of all industrialized countrieswho have ratified Kyoto, distinguishing further between Economies in Transition (EIT) and Non-EITs (industrialied countries)[7]



[7] All amounts have excluded the USA from account because USA is not party to the Kyoto Protocol and unable to purchase CDM credits. When distinguishing between the impact of the CDM on EIT and Non-EIT, it was assumed that CDM credits are almost exclusively being purchased by Non-EIT, industrialized countries.

Figure 5: Annual Distribution of CDM Credits through to 2012, by Geographic Region

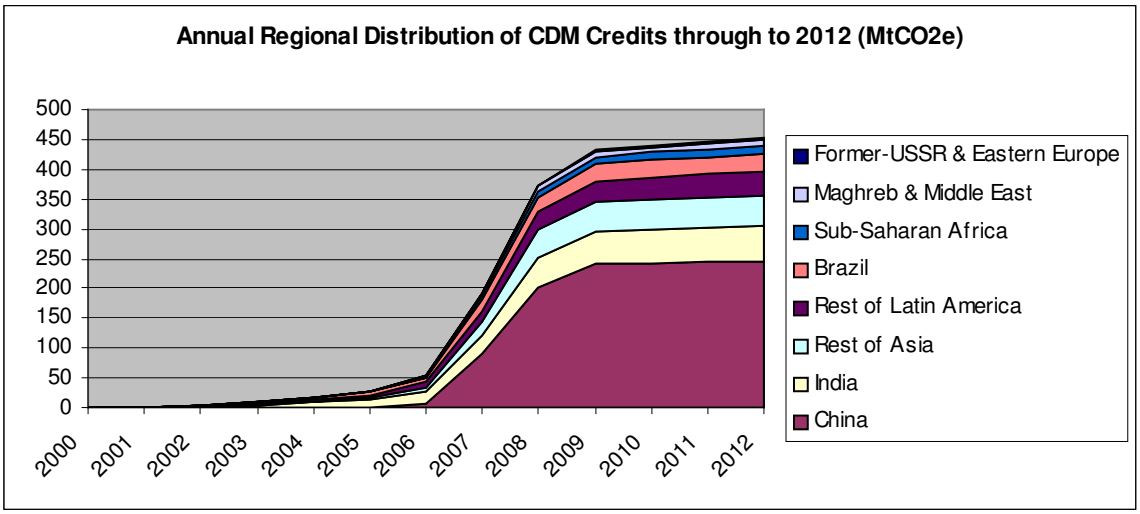
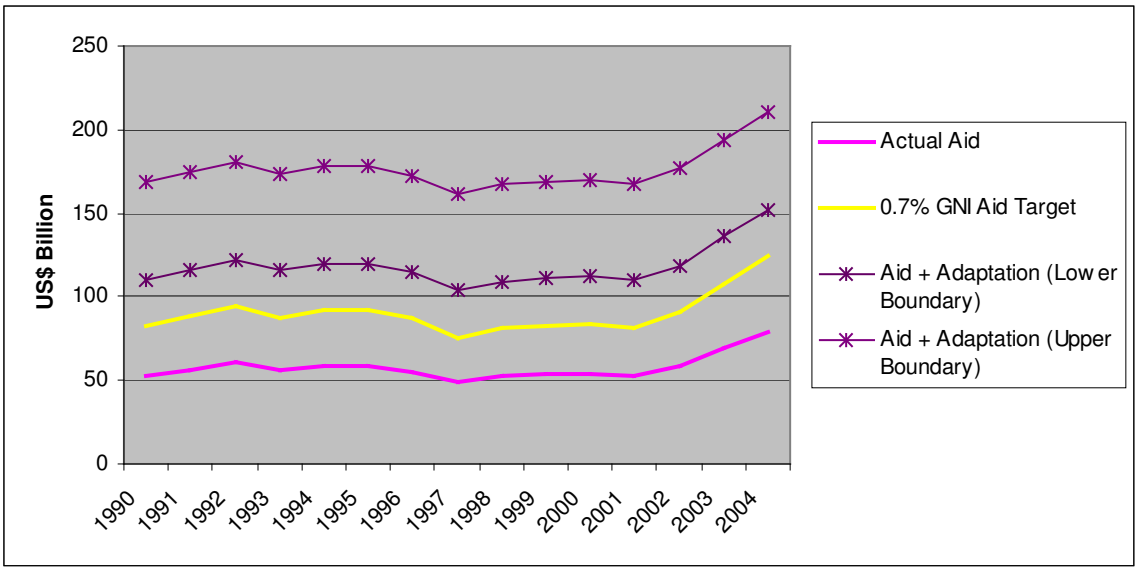


Figure 6: Comparison of historical ODA flows with financing targets for international adaptation to climate change.



Lower Boundary and Upper Boundary for adaptation is estimated at additional US $28 billion and $86 billion per year, as described in the text