
Enhancing Climate Change Mitigation Efforts through Sino-American Collaboration

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This article reviews the pros and cons of the United Nations Framework Convention on Climate Change (UNFCCC) climate change mitigation regime and the polycentric initiatives that have arisen in response to phlegmatic progress in international climate change mitigation efforts. It concludes that the combined efficacy of the UNFCCC regime and these polycentric initiatives embody necessary but insufficient efforts to avert the perils associated with amplified climate change scenarios. The author concludes by proposing that a bilateral agreement between the USA and China that focuses on exploiting national commercial synergies represents a promising strategy through which to encourage enhanced commitment by these two key nations to greenhouse gas reduction. Regardless of whether or not a US–China partnership materialises, the notion of bilateral agreements between developed and developing nations—such as Japan and Brazil, or India and the EU block of nations—and of the ensuing competition among these national pairings could be a missing element to more effective climate change mitigation efforts.

Introduction

In an age of wicked, global problems, climate change boasts the pointiest hat and rides the biggest broom. Its progression augurs widespread economic and ecological damage on a scale that experts are only beginning to fully fathom. Certain researchers contend that global economic losses alone could

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be as high as 4–20% of global Gross Domestic Product (GDP), while the World Bank estimates global adaptation costs at US\$75 billion to \$100 billion each year between 2010 and 2050.¹ On the ecological front, even limiting global warming to a target of 2°C will not prevent species extinctions of up to 30%, according to the IPCC.²

Conversely, the mitigation of climate change also requires significant economic commitments from sovereign nations that possess disparate transitional capacities and incommensurable exposure to climate change risks.³ For perspective, Tian and Whalley present research suggesting that investment equal to 3–5% of GDP would be required in many developing countries in order to support the necessary technological transition to cleaner technologies.⁴

Regardless of how this global drama unfolds, there will be significant winners and losers. On one hand, green businesses are flourishing as governments commit funds to subsidise green technologies. On the other, impoverished communities that cannot afford to finance abatement measures face the prospects of elevated hardship. Front and centre in this challenge are powerful, politically entrenched actors that stand to lose in any technological transition that upsets the economic status quo.

In recognition of the fact that simply clicking one's heels together will not transport us back to simpler, less perilous times, individuals, communities, organisations, and political bodies have begun to respond to this threat with action. The political flagship supporting many mitigation efforts is that of the United Nations Framework Convention on Climate Change (UNFCCC), signed by 193 member nations, that aims to 'achieve stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system'.⁵

In 1997, UNFCCC member nations endorsed the Kyoto Protocol (KP) at the third conference of the parties to the UNFCCC (COP3) held in Kyoto. The KP was predicated upon two key legal environmental principles: the polluter pays principle and the principle of common but differentiated

¹ For more details, see Valentina Bosetti, Carlo Carraro and Massimo Tavoni, 'Climate Change Mitigation Strategies in Fast-Growing Countries: The Benefits of Early Action', *Energy Economics*, Vol. 31, No. 2 (2009), pp. S144–51; Cabinet Office—HM Treasury, *The Stern Review: Report on the Economics of Climate Change* (London: Cabinet Office, 2006); 'The Global Climate Change Imperative', *Business Week*, April 16, 2007, and Radoslav S. Dimitrov, 'Inside UN Climate Change Negotiations: The Copenhagen Conference', *Review of Policy Research*, Vol. 27, No. 6 (2010), pp. 795–821.

² Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2007: Synthesis Report* (Geneva: IPCC, 2007).

³ Xiang Li, Taro Takahashi, Nobuhiro Suzuki, and Harry M. Kaiser, 'The Impact of Climate Change on Maize Yields in the United States and China', *Agricultural Systems*, Vol. 104, No. 4 (2011), pp. 348–53.

⁴ Huifang Tian and John Whalley, 'Trade Sanctions, Financial Transfers and BRIC's Participation in Global Climate Change Negotiations', *Journal of Policy Modeling*, Vol. 32, No.1 (2010), pp. 47–63.

⁵ *United Nations Framework Convention on Climate Change* (New York: United Nations, 1992).

responsibilities. In essence, member nations agreed that industrialised nations (Annex I nations) would commit first to greenhouse gas (GHG) reduction targets, on the premise that current atmospheric concentrations of GHG are the result of historic accumulation of GHG emitted primarily by industrialised nations. After the first round of GHG emission reduction commitments, all nations would then commit to reduction targets, given their respective capacities to do so. KP member nations also acknowledged that developing countries do not possess the level of economic capability necessary to finance a transition to alternative technologies for reducing GHG emissions. Industrialised nations would therefore establish financial mechanisms to assist developing nations in facilitating a transition. As of February 2011, 193 parties (192 States and 1 regional economic integration organisation) had ratified the Kyoto Protocol. The total global percentage of Annex I parties emissions has been estimated at 63.7%.⁶

From inception, the appropriateness of placing so much reliance on the efficacy of an unenforceable, voluntary GHG emission reduction agreement that initially incorporated little more than half of the world's GHG emissions was a source of contentious discourse. On one side were the supporters of the UNFCCC process, who generally conceded the insufficiency of the KP but were largely unified in contending that it was a fully inclusive, formal agreement that provides a forum for catalysing further cooperation.⁷ On the other side were detractors that levied a legion of criticisms including *inter alia* that: (i) the KP involves too many actors pursuing widely disparate self-interests; (ii) the need for consensus stymies agreement; (iii) the KP itself lacks enforceability; (iv) the rigid nature of the KP prevents continuous improvement; and (v) the structure of the document itself is based on past approaches to addressing other international environmental problems that are poor analogies to climate change.⁸

⁶ Details on the current status of Annex I party emissions can be found at the UNFCCC website: http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php accessed 2 March 2011. This site also provides access to a copy of the Kyoto Protocol to the United Nations Framework Convention on Climate Change.

⁷ For more background, see Stuart Eizenstat, 'Stick with Kyoto: A Sound Start on Global Warming', *Foreign Affairs*, Vol. 77, No. 3 (1998), pp. 119–22; Emma L. Tompkins and Helene Amundsen, 'Perceptions of the Effectiveness of the United Nations Framework Convention on Climate Change in Advancing National Action on Climate Change', *Environmental Science & Policy*, Vol. 11, No. 1 (2008), pp. 1–13; and Gary Bryner, 'Lessons from the Kyoto Protocol for the Design of Future Global Climate Accords: Framing the Issues Surrounding The Transformation of Climate and Energy Policy', paper presented at the annual meeting of the International Studies Association, Chicago, February 28 to March 3, 2007.

⁸ For further discussion, see Gregory F. Nemet, 'Robust Incentives and the Design of a Climate Change Governance Regime', *Energy Policy*, Vol. 38, No. 11 (2010), pp. 7216–25; Gwyn Prins and Steve Rayner, 'Time to Ditch Kyoto', *Nature*, Vol. 449, No. 7165 (2007), pp. 973–5; and David G. Victor, Joshua C. House and Sarah Joy, 'A Madisonian Approach to Climate Policy', *Science*, Vol. 339, No. 5742 (2005), pp. 1820–1.

Fifteen years since the drafting of the Kyoto Protocol, the wisdom of continuing to support the UNFCCC process as it now stands is being debated perhaps even more vociferously. This is due to accelerated concerns that the absence of substantive progress in curtailing GHG emissions is pushing the problem past a point of resolution. Advocates for continuing the process argue that there are signs of progress despite the complexity of such broad negotiations. Detractors point out that the agreement made in Durban essentially constitutes the death knell of the Kyoto Protocol, contending that there will be a new agreement.

The intent of this article is to review and evaluate the current status of climate change mitigation efforts in an attempt to identify process enhancements. The section ‘UNFCCC Advocates’ begins by examining the arguments in support of the claim that the UNFCCC process is moving in the right direction. The section ‘UNFCCC Regime Inefficiencies’ examines the inefficiencies imputed to the UNFCCC process and considers which of them can be remedied, given the constraints of the UNFCCC framework. These analyses conclude that the UNFCCC process does have a role to play in international climate change mitigation efforts. The perils associated with advanced stages of climate change, however, mandate that parallel alternative strategies be pursued to reduce the risk of failure and enhance the pace of technological transition. The section ‘Polycentric Initiatives’ introduces the merits of a polycentric approach to climate change mitigation and provides examples of alternative architectures that are currently in place. The section ‘What is Missing?’ tries to identify significant missing components within the network of climate change mitigation efforts. It concludes that the phlegmatic approaches to GHG emission reduction that China and the USA display represent the greatest challenge to global GHG emission reduction efficacy. The section ‘The Allure of a Bilateral Agreement’ accordingly proposes a US–China bilateral agreement as a useful supplemental initiative for expediting GHG mitigation. Finally, the ‘Conclusion’ section highlights the merits of establishing bilateral agreements between developed–developing nations—pairings that might provide both the motivation and competition necessary to encourage a faster pace of reduced greenhouse gas emissions.

Aside from providing a review of climate change mitigation efforts, this article’s main contribution is that of advancing an argument for enhanced bilateral cooperation between strategic pairings of developed and developing nations in general, and between China and the USA in particular. Until now, the USA and China have vied as economic rivals, thus impeding one another from more ambitious commitments to GHG reductions.⁹ This article argues that this adversarial relationship is unnecessary; moreover, that

⁹ Jørgen Delman, ‘China’s “Radicalism at the Center”: Regime Legitimation through Climate Politics and Climate Governance’, *Journal of Chinese Political Science*, Vol. 16, No. 2 (2010), pp. 1–23.

economic and political benefits would accrue to China, the USA, and the international community from enhancing Sino-American collaboration in regard to climate change mitigation initiatives.

UNFCCC Advocates

It would be hyperbole to suggest that the UNFCCC process lacks merits. The fact that 193 nations have joined the convention is testament in itself to the perceived benefits of a collective, international forum for discussing the climate change dilemma. No advocate of the UNFCCC process who wishes to be taken seriously, however, would argue that the UNFCCC regime is flawless. What many supporters would contend is that climate change is a highly complex problem involving disparate ideologies, powerful special-interest groups and emotionally affected stakeholders that necessitates fostering technical, social and economic change on an unprecedented scale. Therefore, most advocates would argue that the process is working, but not as fast as is required to abate the worse consequences of global warming. Tompkins and Amundsen effectively summarise this pro- UNFCCC perspective:

Since 1994, despite criticisms that the Convention is ‘the least ambitious programme that could have been developed’, the lack of stabilisation targets, the weak implementation systems, and the lack of penalties for non-compliance, several outputs have been developed with a view to achieving the ultimate objective of the Convention (as stated in Article 2). These include: building an information base on what parties are doing to achieve the objectives set out in the Convention through National Communications and National Adaptation Plans of Action; the Kyoto Protocol; funding mechanisms for adaptation and annual discussion among the parties to work towards the objective. . . . The Convention [also] encourages wider social support for climate change action by promoting: research; national planning; public awareness and community building among states.¹⁰

There are signs that progress is occurring through a sequence of COP baby steps. At the UNFCCC COP14 meeting in Bali in 2008, a roadmap was agreed upon in order to take negotiations forward. The UNFCCC COP15 meeting in Copenhagen in 2009 confirmed the common goal of keeping global warming to 2°C.¹¹ The Copenhagen Accord reached at the COP15 coaxed emission reduction promises from approximately 140 countries representing 86.8% of global GHG emissions.¹² Connie Hedegaard, European

¹⁰ Emma L. Tompkins and Helene Amundsen, ‘Perceptions of the Effectiveness of the United Nations Framework Convention on Climate Change in Advancing National Action on Climate Change’, pp. 1–13.

¹¹ Raymond Cléménçon, ‘The Bali Road Map’, *The Journal of Environment & Development*, Vol. 17, No.1 (2008), pp. 70–94.

¹² Jorgen Delman, ‘China’s “Radicalism at the Center”’, pp. 1–23.

Commissioner for Climate Action, summarised the significance of the progress made in Copenhagen:

First, industrialised and developing countries alike accepted for the first time that they share joint responsibility for keeping global warming below 2°C in order to avert the worst impacts of climate change... The emission pledges made so far fall well short of what is needed to stay below 2°C, but they are a start... Second, the industrialised world has put a considerable amount of money on the table to help developing countries combat climate change: nearly \$30 billion in financing for the next three years—what we call ‘fast start’ financing—and for the longer term \$100 billion a year by 2020... Third, in several areas, and notably on the issue of transparency, the Copenhagen Accord provides important political guidance for the continuing negotiations on a global agreement.¹³

At the UNFCCC COP16 meeting in Cancun in 2010, commitments to financial support were made and strategies advanced for enhancing technological transfer and capacity building. Ostensibly, as supporters would contend, this meeting constituted a period of requisite entrenchment during which parties began fleshing out the strategy for moving the Copenhagen Accord forward.

At the UNFCCC COP17 meeting in Durban in 2011, all the parties in attendance (including the USA, China, and India) agreed to join a legally binding treaty whose terms would be agreed upon by 2015 for implementation by 2020. The parties also agreed to create a Green Climate Fund that would distribute US\$100 billion each year to impoverished countries to assist with their climate impact adaptation. Finally, as this article was about to be published, the UNFCCC COP18 meeting in Qatar had just concluded with parties agreeing to the ‘Doha Climate Gateway’ which extends the Kyoto Protocol for eight more years and provides direction for negotiating a new pact to supplant the Kyoto Protocol in 2020. Clearly, there are signs of progress towards closing an ideological divide between developed and developing nations that even three years ago seemed unbridgeable.

Yet, as Connie Hedegaard acknowledged post-Copenhagen, progress is far from ideal:

I want to be very clear about this: Kyoto alone will not keep global warming below 2°C—it covers less than 30% of global emissions. Another condition for us is that the serious weaknesses which undermine Kyoto’s environmental integrity be rectified... Europe would in any case much prefer a global deal to take the form of a single new treaty that covers both tracks. The two-track structure, where the main difference today is that the USA is a party to the Convention but not to Kyoto, is terribly unwieldy and inefficient.¹⁴

¹³ Connie Hedegaard, ‘Cancun Must Take Us towards a Global Climate Deal’, *European View*, Vol. 9, No. 2 (2010), pp. 1–5.

¹⁴ *Ibid.*

In short, even supporters of the UNFCCC process recognise that the regime has significant shortcomings and that there are many hurdles to clear as negotiators turn to the contentious challenge of setting post-2012 targets. The crux of the debate between advocates and opponents of the UNFCCC process is whether or not the failings associated with the UNFCCC process can be expediently rectified to enable GHG reductions sufficient to avert the worse consequences attributed to climate change. In order to address this question, it is necessary to understand both the scale and scope of inefficiencies imputed to the UNFCCC process in general, and to the KP in particular.

UNFCCC Regime Inefficiencies

Ideological Polarisation

The debate over how to quantify the ‘common but differentiated responsibilities’—the commonly agreed tenet underlying the UNFCCC framework¹⁵—has not dissipated. Twenty years later, member states are still deeply divided over the scale of further Annex I nation commitments, the timing and scale of Annex II nation commitments, the pace at which global emission reductions should be encouraged, and the methods and responsibility for financing such reductions.¹⁶

Certain researchers have over-simplified the UNFCCC regime by describing it as a contest between two camps—one camp comprising developed nations that support a single global, legally binding treaty incorporating commitments from both developed and developing nations; the other comprising developing nations that wish to see parallel negotiations directed at (i) solidifying commitments from Annex I nations, and (ii) identifying feasible methods to support developing nation participation.¹⁷ The second group essentially supports the two-track process represented by the Ad Hoc Working Group on Further Commitments for Annex I parties under the Kyoto Protocol (AWG-KP) and the Ad Hoc Working Group on Long-term Cooperative Action under the UNFCCC (AWG-LCA).

The situation, however, is far more complex than the ‘two camp’ perspective suggests. For example, there are within the developing nation cohort, nations that demand an additional grace period prior to committing to reduction targets, nations that prefer a voluntary system, and nations that prefer commitments based on alternative benchmarks such as improved energy efficiency or emissions per capita. Furthermore, there is widespread

¹⁵ *United Nations Framework Convention on Climate Change*.

¹⁶ See Radoslav S. Dimitrov, ‘Inside UN Climate Change Negotiations’, pp. 795–821; and Peter Christoff, ‘Cold Climate in Copenhagen: China and the United States at COP15’, *Environmental Politics*, Vol. 19, No. 4 (2010), pp. 637–56.

¹⁷ Radoslav S. Dimitrov, ‘Inside UN Climate Change Negotiations’, pp. 795–821.

intra-cohort disagreement over the magnitude of reduction commitments that developing nations should undertake.¹⁸

Many researchers would agree that these different perspectives on what represents a fair and just contribution to mitigating this global common problem inhibit climate change negotiations.¹⁹ Ekholm et al.²⁰ have recently demonstrated how five different perspectives on equity (egalitarian, sovereign, horizontal, vertical, and equal responsibility) can justify targets based on emissions per capita, future emissions, emissions per GDP, reduction targets based on historical emissions, or reduction targets based on ability to pay. Lange et al.²¹ similarly apply different equity principles, such as the egalitarian principle, the sovereignty principle, the polluter pays principle, and the ability to pay principle, to demonstrate how application of these different perspectives on equity undermines consensus in emission reduction target-setting.

These ideological differences are amplified by incomplete scientific and economic understanding of the consequences associated with amplified levels of GHG concentrations in our atmosphere. Incomplete knowledge influences the exigency with which nations view problem resolution.²² It also makes it difficult to evaluate the effectiveness of current and future commitments.²³ Under such circumstances, ‘facts’ tend to reflect ideologies.²⁴

Structural Flaws

In addition to the ideological polarisation that retards the UNFCCC negotiation process, numbers of notable structural flaws associated with the KP also undermine its effectiveness. This section reviews some of the more prominent weaknesses. They include: lack of emission reduction commitments by the USA and China, complications caused by too many cooks in

¹⁸ Dalia Streimikiene and Stasys Girdzijauskas, ‘Assessment of Post-Kyoto Climate Change Mitigation Regimes Impact on Sustainable Development’, *Renewable and Sustainable Energy Reviews*, Vol. 13, No. 1 (2009), pp. 129–41.

¹⁹ Andreas Lange, Andreas Löschel, Carsten Vogt and Andreas Ziegler, ‘On the Self-serving Use of Equity Principles in International Climate Negotiations’, *European Economic Review*, Vol. 54, No. 3 (2010), pp. 359–75.

²⁰ Tommi Ekholm, Sampo Soimakallio, Sara Moltmann, Niklas Höhne, Sanna Syri and Ilkka Savolainen, ‘Effort Sharing in Ambitious, Global Climate Change Mitigation Scenarios’, *Energy Policy*, Vol. 38, No. 4 (2010), pp. 1797–1810.

²¹ Andreas Lange, Andreas Löschel, Carsten Vogt and Andreas Ziegler, ‘On the Self-serving Use of Equity Principles in International Climate Negotiations’, pp. 359–75.

²² Aninash K. Dixit and Robert S. Pindyck, *Investment Under Uncertainty* (Princeton: Princeton University Press, 1994); and Jon Anda, Alexander Golub and Elena Strukova, ‘Economics of Climate Change under Uncertainty: Benefits of Flexibility’, *Energy Policy*, Vol. 37, No. 4 (2009), pp. 1345–55.

²³ Emma L. Tompkins and Helene Amundsen, ‘Perceptions of the Effectiveness of the United Nations Framework Convention on Climate Change in Advancing National Action on Climate Change’, pp. 1–13.

²⁴ Frans Berkhout, ‘Reconstructing Boundaries and Reason in the Climate Debate’, *Global Environmental Change*, Vol. 20, No. 4 (2010), pp. 565–9.

the kitchen, the Kyoto Protocol's consensus rule, timorous emission reduction targets, the unenforceable nature of national commitments, the failings of the Clean Development Mechanism (CDM), and the lack of effective monitoring capability. Each topic will be addressed in sequence.

The greatest failing of the KP by far is that the USA and China have made no GHG emission reduction commitments. These two countries are currently responsible for more than 40% of global greenhouse gas emissions. If the two nations were to commit to emission reduction targets, the KP could be lauded for including commitments from nations that collectively contribute over 80% of global GHG emissions. Without reduction commitments from the USA and China, the KP is doomed to have only minor impact.²⁵ Unfortunately, these two nations remain 'largely imprisoned by old fault lines' and appear unwilling to undertake any significant emission reduction commitments without the other party taking action first.²⁶ China has repeatedly expressed resistance to accepting any cap on its aggregate GHG emissions due to concerns that such commitments might impede economic growth.²⁷ The USA has actually passed legislation echoing these concerns—the Byrd-Hagel Resolution.²⁸

Another prominent KP flaw relates to one of its more laudable features—inclusiveness. On one hand, as mentioned earlier, all 193 nations have equal say in what is decided. This is particularly commendable in regard to the 42-member Alliance of Island States (AOIS) that collectively contribute virtually nil to climate change but whose existence is actually jeopardised by sea-level rise.²⁹

The problem with inclusiveness is that the negotiation process becomes congested and agreements become less likely. Consider, for instance, the COP15 conference in Copenhagen. Described as 'the largest summit in the history of international diplomacy',³⁰ it was attended by 10 500 delegates representing 190 states, more than 120 heads of state and government, 13 500 observers from civil society, and 3000 journalists.³¹ In such large-scale negotiations, each national team employs disparate skills and tactics while attempting to accomplish disparate objectives. The task of achieving consensus is consequently gargantuan. Simply put, too many cooks have spoiled the Kyoto broth.

²⁵ Josh Eastin, Reiner Grundmann and Aseem Prakash, 'The Two Limits Debates: "Limits to Growth" and Climate Change', *Futures*, Vol. 43, No. 1 (2011), pp. 16–26.

²⁶ Peter Christoff, 'Cold Climate in Copenhagen', pp. 637–56.

²⁷ Karen Pittel and Dirk T. G. Rübhelke, 'Climate Policy and Ancillary Benefits: A Survey and Integration into the Modelling of International Negotiations on Climate Change', *Ecological Economics*, Vol. 68, No. 2 (2008), pp. 210–20.

²⁸ United States Government, *Byrd-Hagel Resolution*, Washington, DC: US Senate, 1997.

²⁹ C. Betzold, "'Borrowing" Power to Influence International Negotiations: AOSIS in the Climate Change Regime, 1990-1997', *Politics*, Vol. 30, No. 3 (2010), pp. 131–48.

³⁰ Radoslav S. Dimitrov, 'Inside UN Climate Change Negotiations: The Copenhagen Conference', pp. 795–821.

³¹ *Ibid.*, pp. 795–821; Peter Christoff, 'Cold Climate in Copenhagen', pp. 637–56.

Critics of the KP would point out that member nations that are highly dependent on fossil fuel resource revenues, such as Saudi Arabia and Nigeria, would not be expected to play a helpful role in supporting technological transition. As Victor cautions, ‘the effectiveness of an international agreement is limited by the commitment level of the agreement’s least interested party’.³² Furthermore, as greater commitments over shorter time horizons become necessary to mitigate climate change, the financial stakes amplify, heightening reluctance to endorse binding commitments.³³ KP negotiations have been further impeded by weaker nations banding together to exert more coercive force on the negotiation process, exacerbating the challenge.³⁴ Overall, there is compelling evidence that the 193 nations will be hard-pressed to reach consensual agreement, given such disparate national interests.

As a testament to what can be achieved when the number of parties to a negotiated settlement is reduced, the ‘Friends of the Chair’ that initiated the Copenhagen Accord consisted of around 20 countries, including the USA, Brazil, India, and China—all of which possess competing national interests.³⁵

According to the UNFCCC guidelines, all nations are given one vote and all nations must endorse a given proposal before it can be adopted. In other words, even one opposing nation can derail a desirable initiative.³⁶ Needless to say, the consensus rule has been disastrous in terms of negotiation efficiency and effectiveness with ‘hostage-taking and rent-seeking demands’ becoming regular fixtures at COP events.³⁷ To highlight just how obtrusive this structural flaw has been, Dimitrov describes how the failure to ratify the Copenhagen Accord came down to opposition from eight minor nations: Bolivia, Cuba, Nicaragua, Tuvalu, Sudan, Venezuela, Pakistan, and Saudi Arabia.³⁸ It is hence understandable why many delegates departed from Copenhagen with deflated spirits. As Christoff summarised, ‘Copenhagen may mark the end of the democratic moment in global [climate] diplomacy. Oligarchic formations like the self-appointed G-20 will be the space for securing a consensus among the more powerful countries.’³⁹

³² David G. Victor, ‘Toward Effective International Cooperation on Climate Change: Numbers, Interests and Institutions’, *Global Environmental Politics*, Vol. 6, No. 3 (2006), pp. 90–103.

³³ Frans Berkhout, ‘Reconstructing Boundaries and Reason in the Climate Debate’, pp. 565–9.

³⁴ For more details, see C. Betzold, ‘“Borrowing” Power to Influence International Negotiations’, pp. 131–48; and I. William Zartman and Jeffery Z. Rubin, *Power and Negotiation* (Ann Arbor: University of Michigan Press, 2000).

³⁵ Peter Christoff, ‘Cold Climate in Copenhagen’, pp. 637–56.

³⁶ Radoslav S. Dimitrov, ‘Inside UN Climate Change Negotiations’, pp. 795–821.

³⁷ Peter Christoff, ‘Cold Climate in Copenhagen’, pp. 637–56.

³⁸ Radoslav S. Dimitrov, ‘Inside UN Climate Change Negotiations’, pp. 795–821.

³⁹ Peter Christoff, ‘Cold Climate in Copenhagen’, pp. 637–56.

The USA has been widely condemned for failing to ratify the KP, a document that was significantly influenced by American diplomacy. One of the key justifications consistently raised by the Americans for withdrawing support for the KP is that it fails to obtain sufficient commitment to reduce global GHG emissions. As Downs et al. point out, 'A high rate of compliance is often the result of states formulating treaties that require them to do little more than they would do in the absence of a treaty.'⁴⁰ This certainly appears to be the case in regard to initial KP commitments.

The commitments by the EU to reduce GHG emissions by 8% of 1992 levels appear laudable at first glance, until one considers the fact that the UK transitioned away from coal-fired power in the 1990s, and that reunification of East and West Germany catalysed an overhaul of ineffective industrial technologies in East Germany. In short, these two developments alone virtually ensure that the EU meets its initial reduction target through natural industrial transition.⁴¹

Then there is the 'hot air' issue involving Russia and the former Soviet bloc states. When the USA withdrew from the KP, enticing Russia to ratify became the key objective in order to meet the KP validation mandate that Annex I nations must account for 55% of global GHG emissions. In order to lure Russia, a Russian target of zero emission growth based on 1990 levels was proffered. But GHG emissions in Russia in 2007 were already 34% below 1990 levels, not because of concerted efforts to reduce GHG emissions but due to industrial decline. The total 'hot air' infused into the KP process has been estimated at 13 billion tons of CO₂ equivalent, or 6.5% of 1990 global emissions.⁴² Given that the aggregate first-round emission reduction target for Annex I nations under the KP was 5.2%, hot air is a topic that engenders heated criticism.

Advocates of the UNFCCC would be quick to point out that round one GHG emission reduction targets were not ideal but did get the process moving forward, and in the process facilitated the construction of a number of clean energy development projects, such as the CDM, under the auspices of the KP development mechanisms. If, however, the GHG emission reduction commitments by Annex I nations for the 2008–2012 period are any indication of the level of follow-on commitments that Annex I and Annex II nations can expect, criticising progress as too little too late is entirely justified.⁴³

⁴⁰ George W. Downs, et al., 'Is the Good News about Compliance Good News about Cooperation?', *International Organization*, Vol. 50, No. 3 (1996), pp. 379–406.

⁴¹ Stavros Afionis, 'The European Union as a Negotiator in the International Climate Change Regime', *International Environmental Agreements: Politics, Law and Economics*, Vol. 11, No. 4 (2010), pp. 1–20.

⁴² Michel den Elzen, et al., 'Dealing with Surplus Emissions in the Climate Negotiations after Copenhagen: What Are the Options for Compromise?', *Energy Policy*, Vol. 38, No. 11 (2010), pp. 6615–28.

⁴³ Gwyn Prins and Steve Rayner, 'Time to ditch Kyoto', pp. 973–5.

In praise of the KP, the UNFCCC declares that it is ‘among the most comprehensive and rigorous systems of compliance for a multilateral environmental agreement’ and, on paper, it is hard to refute this claim. Under the terms of the KP, Annex I nations that fail to meet their GHG emission reduction commitments will be required to make up the difference plus an additional 30% in the next commitment period. Moreover, the offending nation will also be prevented from making transfers under the KP flexible mechanisms.⁴⁴ These conditions arguably represent significant incentives for Annex I nations to live up to their commitments.

The trouble is, Annex I nations are all sovereign nations. Although the UNFCCC can attempt to enforce compliance through the International Court of Justice or through national courts, if a nation determines that it cannot meet its GHG emission reduction commitments, attempts to enforce compliance will in many cases be fruitless.⁴⁵ Perhaps the most notorious example involves Canada, which has publicly stated that it has no intention of honouring its round one commitment.

This false veil of enforceability has led some critics to go as far as to argue that in the absence of an external authority to impose enforceable rules, no nation (developed or developing) will voluntarily change behaviour to reduce energy use and GHG emissions.⁴⁶ As DeCanio observes, ‘altruism is not a notable feature of international relations.’⁴⁷

The Clean Development Mechanism (CDM) is a flagstone in the construction of a system wherein developed nations support the technological transition necessary to help reduce GHG emissions in developing nations. The promise of the CDM was that it would simultaneously provide developed nations with a supplemental avenue for cost-effectively reducing domestic GHG emissions while supporting technological transition in developing nations.⁴⁸ The reality falls far short of the promise.

The flaws in the CDM have been widely acknowledged. Uncertainties as to the future of the KP have encouraged the development of projects that exhibit front-heavy revenue flows such as methane flaring, which do little to enhance national capacity. Delays in the project approval process that range from months to years increase the risk of investing in CDM projects. Furthermore, the CDM has spawned appalling examples of ‘gaming the

⁴⁴ http://unfccc.int/kyoto_protocol/compliance/items/3024.php, accessed on March 4, 2011.

⁴⁵ Xinyuan Dai, ‘Global Regime and National Change’, *Climate Policy*, Vol. 10, No. 6 (2010), pp. 622–37.

⁴⁶ See Zhongxiang Zhang, ‘How Far Can Developing Country Commitments Go in an Immediate Post-2012 Climate Regime?’, *Energy Policy*, Vol. 37, No. 5 (2009), pp. 1753–7; Elinor Ostrom, ‘Polycentric Systems for Coping with Collective Action and Global Environmental Change’, *Global Environmental Change*, Vol. 20, No. 4 (2010), pp. 550–7.

⁴⁷ Stephen J. DeCanio, ‘The Political Economy of Global Carbon Emissions Reductions’, *Ecological Economics*, Vol. 68, No. 3 (2009), pp. 915–24.

⁴⁸ *Kyoto Protocol to the United Nations Framework Convention on Climate Change* (New York: United Nations, 1998).

system'.⁴⁹ For example, Sovacool and Brown have reported that more than half of the projects accredited by the United Nations involved HFC-23 destruction,⁵⁰ and that HFC-23 creation and destruction was becoming a more profitable business model than that of creating saleable HFC-23 for industrial uses. Although carbon-trading activity has significantly accelerated in recent years, overall volume still 'represents but a drop in the bucket of total carbon emitted'.⁵¹

One final structural flaw associated with the KP is that the monitoring of actual GHG emission reduction is delegated to national authorities that have economic incentives to distort reports if performance falls short of emission reduction commitments. As Vogler further cautions, 'there is limited scope for direct central monitoring of GHG sources and sinks by, for example, earth observation satellites'.⁵² When inadequate oversight is combined with the fact that maintaining a national GHG emission inventory is fraught with measurement complications, one can be excused for viewing national emission reduction reports with a degree of scepticism.

Emerging Obstacles

The combination of ideological polarisation and the numerous structural failings associated with the KP has produced an international climate change negotiation climate fraught with petty bickering and obstructionist behaviour. Disagreements have been amplified due to ongoing scientific uncertainty as to the potential consequences of climate change, which prevents accurate economic and ecological cost analyses. This has been exacerbated by the IPCC controversy that has destabilised public confidence in expert judgment.⁵³

In parallel to this scenario, climate politics have intensified.⁵⁴ Fossil fuel special-interest groups have persistently muddied public understanding of climate change by financing campaigns designed to foster scepticism of scientific analyses related to it.⁵⁵ Meanwhile, technological initiatives such as the promotion of Carbon Capture and Sequestration (CC&S) technologies have emerged as methods to prolong reliance on existing technology and

⁴⁹ Michael Wara, 'Is the Global Carbon Market Working?', *Nature*, Vol. 445, No. 7128 (2007), pp. 595–6.

⁵⁰ Benjamin K. Sovacool and Marilyn A. Brown, 'Scaling the Policy Response to Climate Change', *Policy and Society*, Vol. 27, No. 4 (2009), pp. 317–28.

⁵¹ Josh Eastin, Reiner Grundmann and Aseem Prakash, 'The Two Limits Debates', pp. 16–26.

⁵² John Vogler, 'The Institutionalisation of Trust in the International Climate Regime', *Energy Policy*, Vol. 38, No. 6 (2010), pp. 2681–7.

⁵³ Frans Berkhout, 'Reconstructing Boundaries and Reason in the Climate Debate', pp. 565–9.

⁵⁴ *Ibid.*

⁵⁵ James Hansen, 'Global Warming Twenty Years Later: Tipping Points Near', http://www.columbia.edu/~jeh1/2008/TwentyYearsLater_20080623.pdf. Accessed 11 December 2012.

avoid costly technological transitions.⁵⁶ In short, one could argue that despite ongoing evidence that climate change is progressing at an alarming rate, the pressure needed for an exigent response has become lost in political turmoil.

Certain critics contend that the KP process has actually weakened the international spirit of cooperation by entrenching differences of opinion over the ‘common but differentiated responsibility’ principle and fostering alliances of nations that disrupt the core negotiation process by their pursuit of secondary initiatives aimed at enhancing self-interest.^{57,58} When the COP15 in Copenhagen ended without a binding set of second round GHG emission reduction targets, any vestige of optimism in the existing process was seemingly eradicated.⁵⁹ There are consequently understandable grounds for pessimism as to whether or not these ideologically ensconced parties will be able to cultivate the common ground necessary to produce a new effective climate treaty, as envisaged in Durban.

Another concern that has intensified as the UNFCCC process has progressed is that of the financial capacity of nations to expedite the technological transition necessary to avert the worst consequences attributed to climate change. The scale of investment necessary to transform energy systems alone has been estimated in the tens of trillions of US dollars.⁶⁰ Therefore, the financial pledges made in Copenhagen (US\$30 billion annually between 2010 and 2012 rising to US\$100 billion by 2020) and re-affirmed in Durban and Doha represent but a drop in the bucket in terms of requisite financing.⁶¹

There is increasing concern that key nations such as China and India cannot adopt sufficient GHG emission reduction policies due to financial constraints.⁶² Meanwhile, the current global economic downturn has significantly reduced the financial capacity of developed nations to facilitate domestic GHG emission reduction and to support such efforts in developing nations. Amid this dire backdrop lurks an understanding that the hard work is still to come. As Macintosh explains, ‘Many of the most cost-efficient

⁵⁶ B. Allenby, ‘Climate Change Negotiations and Geoengineering: Is This Really the Best We Can Do?’, *Environmental Quality Management*, Vol. 20, No. 2 (2010), pp. 1–16.

⁵⁷ Radoslav S. Dimitrov, ‘Inside UN Climate Change Negotiations’, pp. 795–821.

⁵⁸ Peter Christoff, ‘Cold Climate in Copenhagen’, pp. 637–56.

⁵⁹ Frank Biermann, ‘Beyond the Intergovernmental Regime: Recent Trends in Global Carbon Governance’, *Current Opinion in Environmental Sustainability*, Vol. 2, No. 3–4 (2010), pp. 284–8.

⁶⁰ Gregory F. Nemet, ‘Robust Incentives and the Design of a Climate Change Governance Regime’, pp. 7216–25.

⁶¹ Catherine Norman, Stephen DeCanio and Lin Fan, ‘The Montreal Protocol at 20: Ongoing Opportunities for Integration with Climate Protection’, *Global Environmental Change*, Vol. 18, No. 2 (2008), pp. 330–40.

⁶² Fang Rong, ‘Understanding Developing Country Stances on Post-2012 Climate Change Negotiations: Comparative Analysis of Brazil, China, India, Mexico, and South Africa’, *Energy Policy*, Vol. 38, No. 8 (2010), pp. 4582–91.

measures have by now been implemented; nevertheless, further GHG emission reductions will be necessary. Building consensus on what a fair distribution of these costs will look like against the backdrop of the economic and financial crisis may well prove much more difficult than making the first steps back in the year 2000.⁶³

The Standoff Continues

Many critics of the UNFCCC process cite this litany of flaws in arguing that the UNFCCC regime is irreparably broken and that a new international approach is needed.⁶⁴ To put the inefficacy of the KP into perspective, Norman et al. point out that the GHG emission reductions indirectly achieved through the Montréal Protocol (the international agreement to mitigate damage to the ozone layer) exceeds round one commitments under the KP by approximately five-fold.⁶⁵

Conversely, the UNFCCC process also has its share of committed proponents. The EU has declared its preference for a single-track approach centred on improving the UNFCCC process.⁶⁶ The G-77 group has also announced its intention to obstruct any efforts to replace the KP.⁶⁷ Dubiety remains, however, as to whether or not the structural problems associated with the KP can be resolved within the rigid fetters of the UNFCCC framework. For example, at the COP15 in Copenhagen, Papua New Guinea proposed that the consensus rule be replaced by a three-fourths majority voting system in order to expedite progress. Unfortunately, adoption of this proposition required consensus agreement; the proposal was rejected.⁶⁸

As the UNFCCC process totters forward, more and more alternative approaches to climate change mitigation and abatement are emerging at community, subnational, national, bilateral, multilateral, and regional

⁶³ Andrew Macintosh and Christian Downie, 'Wind Farms: The Facts and the Fallacies', The Australia Institute, Discussion Paper, No. 91, October 2006.

⁶⁴ To illustrate see: Gwyn Prins and Steve Rayner, 'Time to Ditch Kyoto', pp. 973–5; A Joint Discussion Paper of the James Martin Institute for Science and Civilization, University of Oxford and the MacKinder Centre for the Study of Long-Wave Events, London School of Economics, *The Wrong Trousers: Radically Rethinking Climate Policy*; Barry G. Rabe, 'Beyond Kyoto: Climate Change Policy in Multilevel Governance Systems', *Governance*, Vol. 20, No. 3 (2007), pp. 423–44; Zhongxiang Zhang, 'Multilateral Trade Measures in a Post-2012 Climate Change Regime?: What Can Be Taken from the Montreal Protocol and the WTO?', *Energy Policy*, Vol. 37, No. 12 (2009), pp. 5105–12; and Nicholas A. A. Howarth and Andrew Foxall, 'The Veil of Kyoto: the Political Geography of Greenhouse Gas Mitigation in Australia', *Political Geography*, Vol. 29, No. 3 (2010), pp. 167–76.

⁶⁵ Catherine Norman, Stephen DeCanio and Lin Fan, 'The Montreal Protocol at 20', pp. 330–40.

⁶⁶ Connie Hedegaard, 'Cancún Must Take Us towards a Global Climate Deal', pp. 1–5.

⁶⁷ Michael Gross, 'Climate Jostlings Intensify', *Current Biology*, Vol. 19, No. 22 (2009), pp. R1009–R10.

⁶⁸ Radoslav S. Dimitrov, 'Inside UN Climate Change Negotiations', pp. 795–821.

levels.⁶⁹ As the next section will demonstrate, these initiatives are exerting a positive influence on altering stakeholder behaviour and fostering change.

Polycentric Initiatives

Dai suggests that international cooperation in climate change mitigation is hindered by discord in regard to global climate change regime design, level of top-down control required, degree of centralisation, structuring of national commitments, and integration with domestic policies.⁷⁰ That might be a fair comment in terms of unified global cooperation; however, the picture is far more complicated and far more promising at subglobal levels.

As UNFCCC negotiations labour on, a host of supplemental initiatives have merged to promote action. Climate change mitigation has made its way on to the agenda of numerous multilateral bodies, including the G-8 and the G-20. Moreover, new multilateral discussion forums and partnerships have evolved, such as the Major Economies' Forum on Energy and Climate Change, the International Renewable Energy Agency, the Asia Pacific Partnership on Clean Development and Climate, the Global Bioenergy Partnership, and the Agency for International Development (AID)'s Global Climate Change Program.⁷¹ More than 330 'partnerships for sustainable development' are registered with the United Nations.⁷²

Furthermore, as the perils of climate change become more apparent, stakeholders of all kinds are searching for ways to participate—radically expanding the scale of involvement. Involvement in climate change mitigation is no longer a government-only issue; the uncertainties and complexities of global carbon governance have fragmented the policy system.⁷³ This web of 'transnational multi-actor governance' ranges in scale from global to regional to subregional to local.⁷⁴

Subnational actors have managed to drive change in the absence of national action. Global networks of major cities have sprung up in order to facilitate change.⁷⁵ The Clinton Climate Change Initiative's C40 Cities Climate Leadership group—comprising member cities from Africa, Asia, Europe, Latin America, and North America—exemplifies this trend. Similarly, within the USA alone, the US Conference of Mayors' Climate

⁶⁹ *Ibid.*

⁷⁰ X. Dai, 'Global Regime and National Change', pp. 622–37.

⁷¹ As documented in: Radoslav S. Dimitrov, 'Inside UN Climate Change Negotiations', pp. 795–821; Benjamin K. Sovacool and Marilyn A. Brown, 'Scaling the Policy Response to Climate Change', pp. 317–28; and Morgan Bazilian, et al., 'Opinion: An Energy Policy Approach to Climate Change', *Energy for Sustainable Development*, Vol. 14, No. 4 (2010), pp. 253–5.

⁷² Frank Biermann, 'Beyond the Intergovernmental Regime', pp. 284–8.

⁷³ *Ibid.*

⁷⁴ Benjamin K. Sovacool and Marilyn A. Brown, 'Scaling the Policy Response to Climate Change', pp. 317–28.

⁷⁵ Frank Biermann, 'Beyond the Intergovernmental Regime', pp. 284–8.

Protection Agreement has enlisted the commitment of 1026 cities to take action on climate change mitigation and abatement, while the US federal government remains mired in a political deadlock.⁷⁶

In addition to an infusion of stakeholder participation from various subsets of civil society, the scope of initiatives has broadened considerably. Specialised groups have emerged to provide enhanced information dissemination, to elevate civic pressure on national governments, to encourage adaptation planning, and to advance technological transfer.⁷⁷

While negotiators continue to argue over who should commit to what within the UNFCCC framework, many of these polycentric initiatives have posted positive results. These fragmented efforts, however, also induce a degree of inefficiency. As Sovacool and Brown point out, 'action at the local and national scales creates different sets of costs and benefits.'⁷⁸ The costs of subglobal initiatives typically arise through duplication of effort and inter-initiative gaming in which players extract multiple benefits from overlapping support programmes.⁷⁹ As Ostrom reasons, however, 'Self-organized, polycentric systems are not a panacea! There are no panaceas... for complex problems such as global warming. The advantage of a polycentric approach is that it encourages experimentation by multiple actors.'⁸⁰ Given the impending perils of climate change and phlegmatic progress within the UNFCCC process, concerns about inefficiency seem far less important than inducing action. There is compelling evidence that, at this stage, all hands on deck are needed to mitigate the worst consequences attributed to climate change.⁸¹

⁷⁶ Elinor Ostrom, 'Polycentric Systems for Coping with Collective Action and Global Environmental Change', pp. 550–7.

⁷⁷ For examples see: Frans Berkhout, 'Reconstructing Boundaries and Reason in the Climate Debate', pp. 565–9; Xinyuan Dai, 'Global Regime and National Change', pp. 622–37; G. Robbert Biesbroek, Rob J. Swart, Timothy R. Carter, Caroline Cowan, Thomas Henrichs, Hanna Mela, Michael D. Morecroft and Daniela Rey, 'Europe Adapts to Climate Change: Comparing National Adaptation Strategies', *Global Environmental Change*, Vol. 20, No. 3 (2010), pp. 440–50; Heleen de Coninck, Carolyn Fischer, Richard G. Newell and Takahiro Ueno, 'International Technology-oriented Agreements to Address Climate Change', *Energy Policy*, Vol. 36, No. 1 (2008), pp. 335–56.

⁷⁸ Benjamin K. Sovacool and Marilyn A. Brown, 'Scaling the Policy Response to Climate Change', pp. 317–28.

⁷⁹ J. Ebeling, *Risks and Criticisms of Forestry-based Climate Change Mitigation and Carbon Trading* (London: Chatham House, 2008).

⁸⁰ Elinor Ostrom, 'Polycentric Systems for Coping with Collective Action and Global Environmental Change', pp. 550–7.

⁸¹ Supporters of this contention include: Intergovernmental Panel on Climate Change, *Climate Change 2007: Synthesis Report* (Geneva: IPCC, 2007); Olivier Bahn, Neil R. Edwards, Reto Knutti and Thomas F. Stocker, 'Energy Policies Avoiding a Tipping Point in the Climate System', *Energy Policy*, Vol. 39, No. 1 (2011), pp. 334–48; Timothy M. Lenton, Hermann Held, Elmar Kriegler, Jim W. Hall, Wolfgang Lucht, Stefan Rahmstorf and Hans Joachim Schellnhuber, 'Tipping Elements in the Earth's Climate System', *Proceedings of the National Academy of Sciences*, Vol. 105, No. 6 (2008), pp. 1786–93; Till Kuhlbrodt, Stefan Rahmstorf, Kirsten Zickfeld, Frode Vikebø, Svein Sundby, Matthias Hofmann, Peter Link, Alberte Bondeau, Wolfgang Cramer and Carlo Jaeger, 'An Integrated Assessment of Changes in the Thermohaline Circulation',

In spite of the inefficiencies blamed on a polycentric approach, such diversity sires a host of compelling benefits. Polycentric initiatives reduce the risk associated with the failure of any specific initiative. Even if the UNFCCC process were to collapse entirely, some level of progress towards climate change mitigation would be ensured thanks to the presence of other initiatives.⁸² Polycentric initiatives also tend to be more effective in generating results because they can be customised to appeal to stakeholders with disparate needs.⁸³ Moreover, because polycentric initiatives enlist participation from a greater diversity of stakeholders, they are inherently more innovative.⁸⁴

Perhaps of most salience in support of a polycentric approach is evidence that problems such as climate change—which influence all levels of society—can only be effectively addressed through initiatives implemented at various scales.⁸⁵ This embodies the ‘matching principle’ in international law that contends that ‘problems involving multiple levels (e.g. global, national, regional, and small scales) should involve contributions at each of these levels’.⁸⁶ Numerous experts support the contention that both bottom-up and top-down approaches to climate change mitigation are necessary in order to ensure that top-level goals translate to local action, and vice versa.⁸⁷

Tompkins and Amundsen succinctly summarise this perspective in regard to the UNFCCC process:

The Convention plays a role in shaping the discourse of climate change and in generating national level responses... but perhaps it is not adequate to inspire national action to resolve the problems of climate change. There is scope for

Climatic Change, Vol. 96, No. 4 (2009), pp. 489–537; Michael Vellinga and Richard Wood, ‘Impacts of Thermohaline Circulation Shutdown in the Twenty-first Century’, *Climatic Change*, Vol. 91, No. 1 (2008), pp. 43–63 and Jianjun Yin, Michael E. Schlesinger and Ronald J. Stouffer, ‘Model projections of rapid sea-level rise on the northeast coast of the United States’, *Nature Geoscience*, Vol. 2, No. 4 (2009), pp. 262–6.

⁸² Gregory F. Nemet, ‘Robust Incentives and the Design of a Climate Change Governance Regime’, pp. 7216–25.

⁸³ Elinor Ostrom, ‘Polycentric Systems for Coping with Collective Action and Global Environmental Change’, pp. 550–7.

⁸⁴ As put forth by: Elinor Ostrom, ‘Polycentric Systems for Coping with Collective Action and Global Environmental Change’, pp. 550–7 and Benjamin K. Sovacool and Marilyn A. Brown, ‘Scaling the Policy Response to Climate Change’, pp. 317–28; Heleen de Coninck, et al., ‘International Technology-oriented Agreements to Address Climate Change’, pp. 335–56 and Aviel Verbruggen, Manfred Fischedick, William Moomaw, Tony Weir, Alain Nadaï, Lars J. Nilsson, John Nyboer and Jayant Sathaye, ‘Renewable Energy Costs, Potentials, Barriers: Conceptual Issues’, *Energy Policy*, Vol. 38, No. 4 (2010), pp. 850–61.

⁸⁵ Benjamin K. Sovacool and Marilyn A. Brown, ‘Scaling the Policy Response to Climate Change’, pp. 317–28.

⁸⁶ Elinor Ostrom, ‘Polycentric Systems for Coping with Collective Action and Global Environmental Change’, pp. 550–7.

⁸⁷ For specific examples, see Xinyuan Dai, ‘Global Regime and National Change’, pp. 622–37; Benjamin K. Sovacool and Marilyn A. Brown, ‘Scaling the Policy Response to Climate Change’, pp. 317–28.

many additional initiatives, through collaboration, trade or aid, and through bilateral agreements.⁸⁸

What is Missing?

Despite all current efforts to abate GHG emissions, results are insufficient. Dimitrov succinctly summarises the challenge as advanced by the IPCC, 'To avoid the most catastrophic impacts and limit temperature rise to below 2°C, advanced economies would need to cut greenhouse gas (GHG) emissions 25–40 percent by 2020, and global emissions need to be reduced 50–80 percent by 2050.'⁸⁹ Given the analysis put forward in this article, it appears that the UNFCCC process will continue to plod towards establishing follow-on emission reduction targets, which will likely fall short of the requisite aggregate GHG emission reductions necessary to avert the worst consequences of climate change. It also appears that in the interim, a number of polycentric initiatives will continue to foster action and encourage greater (albeit insufficient) progress. Therefore, it is necessary to consider what could be done to facilitate further achievement of the requisite deep GHG emission reductions.

On reflecting upon what is missing, one issue possessing preeminent importance and exigency stands out; the USA and China need to contribute more proactively to the GHG emission reduction process. These two nations are the world's two largest aggregate GHG emitters, responsible for over 40% of total global emissions.⁹⁰ It is widely recognised that without rigorous contributions from these two nations, anything the rest of the world does to mitigate GHG emissions will be an insufficient prescription to solve the problem.⁹¹

Unfortunately, the USA and China have been two of the most recalcitrant nations in international climate change negotiations.⁹² Certain analysts have even suggested that for these two nations, international climate change negotiations are less about climate than about asserting themselves as

⁸⁸ Emma L. Tompkins and Helene Amundsen, 'Perceptions of the Effectiveness of the United Nations Framework Convention on Climate Change in Advancing National Action on Climate Change', pp. 1–13.

⁸⁹ Radoslav S. Dimitrov, 'Inside UN Climate Change Negotiations', pp. 795–821.

⁹⁰ Peter Christoff, 'Cold Climate in Copenhagen', pp. 637–56.

⁹¹ For further analysis see: Valentina Bosetti, Carlo Carraro, and Massimo Tavoni, 'Climate Change Mitigation Strategies in Fast-Growing Countries', pp. S144–S51; Carmen Richerzhagen and Imme Scholz, 'China's Capacities for Mitigating Climate Change', *World Development*, Vol. 36, No. 2 (2008), pp. 308–24 and Scott Victor Valentine, 'Towards the Sino-American Trade Organization for the Prevention of Climate Change (STOP-CC)', *The Chinese Journal of International Politics*, Vol. 4, No. 4 (2011), pp. 447–74.

⁹² Michèle B. Baettig, et al., 'Measuring Countries' Cooperation within the International Climate Change Regime', *Environmental Science & Policy*, Vol. 11, No. 6 (2008), pp. 478–89.

dominant global forces.⁹³ As Afionis concluded in regard to COP15, ‘negotiations between the USA and China were largely about making sure they were not seen to be stepping too far ahead of each other.’⁹⁴ This political jousting has both discouraged proactive commitments from the two nations and undermined the leadership role that the EU has attempted to provide in global climate change negotiations.⁹⁵

Leaders of both nations have acknowledged the perils associated with unabated climate change⁹⁶; however, in both nations, short-term national economic interests trump long-term global environmental stability.⁹⁷ Leaders from both nations have expressed opposition to targets that undermine national competitiveness. Consequently, it has been suggested that an alternative model of cooperation between the nations could better assuage short-term economic concerns.⁹⁸ As Christoff emphasises, ‘Until their relationship changes, the USA and China—and international climate negotiations—will continue to remain captured and constrained by domestic institutions and circumstances. To transcend these limitations requires the USA and China to foster a more substantial transformative “climate collaboration” than currently exists—one that directly addresses their respective political and economic needs while rapidly decarbonising their entwined economies’.⁹⁹

The Allure of a Bilateral Agreement

The USA and China share a high degree of ideological common ground in regard to climate change mitigation policy. Both nations appear focused on a ‘no regret climate change strategy’ that focuses on initiatives to reduce GHG emissions while simultaneously providing economic benefits.¹⁰⁰ There is, therefore, reason to believe that a bilateral relationship between the two nations could both facilitate opportunities and avoid contentious rifts over burden-sharing. It may be possible to alter the current ‘superficial

⁹³ Peter Christoff, ‘Cold Climate in Copenhagen’, pp. 637–56.

⁹⁴ Stavros Afionis, ‘The European Union as a Negotiator in the International Climate Change Regime’, pp. 1–20.

⁹⁵ So contend both Peter Christoff, ‘Cold Climate in Copenhagen’, pp. 637–56; and Stavros Afionis, ‘The European Union as a Negotiator in the International Climate Change Regime’, pp. 1–20.

⁹⁶ Jianxiang Yang, *China Speeds Up Renewable Energy Development* (Washington D.C: Worldwatch Institute, 2006).

⁹⁷ For further discussion, see Peter Christoff, ‘Cold Climate in Copenhagen’, pp. 637–56 and Carmen Richerzhagen and Imme Scholz, ‘China’s Capacities for Mitigating Climate Change’, pp. 308–24.

⁹⁸ Scott Victor Valentine, ‘Towards the Sino-American Trade Organization for the Prevention of Climate Change (STOP-CC)’, pp. 447–74.

⁹⁹ Peter Christoff, ‘Cold Climate in Copenhagen’, pp. 637–56.

¹⁰⁰ For further discussion, see Peter Christoff, ‘Cold Climate in Copenhagen’, pp. 637–56; and Carmen Richerzhagen and Imme Scholz, ‘China’s Capacities for Mitigating Climate Change’, pp. 308–24.

friendship' through efforts to exploit the economic opportunities inherent in climate change mitigation programmes.¹⁰¹

Without a doubt, there are areas in which American and Chinese firms are locked in fierce competition and where political and economic arguments to avoid cooperation inevitably arise. Competition in a global economy is unavoidable. However, there are also instances in international collaboration of initiatives that feature synergies. In fact, the possibility of collaboration has been acknowledged—even among competing firms—the term *cooperation* having been coined to describe such a scenario. This is particularly true in regard to collaborations between firms from developing and developed nations, where corporate strengths tend to differ greatly.¹⁰²

To illustrate, a number of noteworthy benefits ensue from a bilateral agreement between these nations. First, a bilateral approach limits the number of actors involved in a negotiation and hence improves the quality of the end-result.¹⁰³ Secondly, a bilateral approach allows both nations to supervise initiatives at a degree deep enough to bring about true progress. To achieve maximum impact, programmes have to filter down through the levels of community, firm, family, and the individual.¹⁰⁴ Thirdly, in order to succeed, many climate change mitigation initiatives require funding, know-how, business experience, and local knowledge.¹⁰⁵ A bilateral approach enables cooperating parties to manage integration more efficiently.¹⁰⁶ Fourthly, it makes intuitive sense that the two nations responsible for the highest GHG emissions combine their respective national competencies to expedite GHG emission reductions. The two nations indeed appear to understand that their fates are entwined. In 2009, when the USA announced a plan to reduce GHG emissions by 17% of 2005 levels by 2020, China responded the next day with the announcement that it would cut its carbon intensity per unit of GDP by 40–45% of 2005 levels by 2020.¹⁰⁷

¹⁰¹ The background for this position is provided by Connie Hedegaard, 'Cancún Must Take Us towards a Global Climate Deal', pp. 1–5; Jared C. Carbone, et al., 'The Case for International Emission Trade in the Absence of Cooperative Climate Policy', *Journal of Environmental Economics and Management*, Vol. 58, No. 2 (2009), pp. 266–80 and Xuetong Yan, 'The Instability of China–US Relations', *The Chinese Journal of International Politics*, Vol. 3, No. 3 (2010), pp. 263–92.

¹⁰² Scott Victor Valentine, 'Towards the Sino-American Trade Organization for the Prevention of Climate Change (STOP-CC)', pp. 447–74.

¹⁰³ I. William Zartman and Jeffery Z. Rubin, *Power and Negotiation* (Ann Arbor: University of Michigan Press, 2000).

¹⁰⁴ For examples see Elinor Ostrom, 'Polycentric Systems for Coping with Collective Action and Global Environmental Change', pp. 550–7; and David G. Ockwell, Ruediger Haum, Alexandra Mallett and Jim Watson, 'Intellectual Property Rights and Low Carbon Technology Transfer: Conflicting Discourses of Diffusion and Development', *Global Environmental Change*, Vol. 20, No. 4 (2010), pp. 729–38.

¹⁰⁵ Karlija Morsink, Peter S. Hofman and Jon C. Lovett, 'Multi-stakeholder Partnerships for Transfer of Environmentally Sound technologies', *Energy Policy*, Vol. 39, No. 1 (2011), pp. 1–5.

¹⁰⁶ Scott Victor Valentine, 'Towards the Sino-American Trade Organization for the Prevention of Climate Change (STOP-CC)', pp. 447–74.

Fifthly, restricting an agreement to bilateral parties helps minimise the risk that political change will bring about changes to the agreement.¹⁰⁸

There are also significant global benefits associated with a positive bilateral commitment by China and the USA to collaborate on green economic development issues. First, climate change is but one concern when taking into account the growing impact of economic activities on our global ecosystems.¹⁰⁹ Establishing a basis for positive cooperation now will enable these two major economies to advance towards improving the sustainability of their respective production and consumption processes. Secondly, the animosity between the USA and China as exhibited in UNFCCC climate change negotiations exposes the roots of escalating competition between the two nations for global political and economic supremacy.¹¹⁰ As the world experienced between the early 1960s and the late 1980s, contests of power between superpowers tend to produce more negative externalities than positive developments. Collaborating on GHG reduction represents an opportunity for these two superpowers to mitigate a digressive power contest.¹¹¹ Thirdly, many of the other nations that have ratified the KP exhibit a lacklustre approach to climate change negotiations, in part because the standoff between the USA and China discourages other nations from taking leadership. Fourthly and perhaps of most importance, a collaborative relationship between these two nations could provide both with the necessary assurances that short-term sacrifices will result in substantive long-term progress towards climate change mitigation; it could consequently encourage both nations to commit voluntarily to emission reduction targets that would otherwise be unachievable through multilateral negotiations.

Conclusion

Challenges will undoubtedly arise in facilitating a China–US agreement to collaborate on GHG mitigation initiatives. Both nations face sizeable domestic political obstacles to arriving at such an agreement—the USA in terms of political deadlock and China in terms of cascading policy to the provinces.¹¹² There are net benefits, however, to a collaboration of this

¹⁰⁷ Jørgen Delman, ‘China’s “Radicalism at the Center”’, pp. 1–23.

¹⁰⁸ Gregory F. Nemet, ‘Robust Incentives and the Design of a Climate Change Governance Regime’, pp. 7216–25.

¹⁰⁹ Scott Victor Valentine, ‘Disarming the Population Bomb’, *International Journal of Sustainable Development & World Ecology*, Vol. 17, No. 2 (2010), pp. 120–32.

¹¹⁰ Peter Christoff, ‘Cold Climate in Copenhagen’, pp. 637–56.

¹¹¹ Scott Victor Valentine, ‘Towards the Sino-American Trade Organization for the Prevention of Climate Change (STOP-CC)’, pp. 447–74.

¹¹² To illustrate, see Jørgen Delman, ‘China’s “Radicalism at the Center”’, pp. 1–23; Morgan Bazilian, Hugh Outhred, Alan Miller and Melinda Kimble, ‘Opinion: An Energy Policy Approach to Climate Change’, pp. 253–5 and Tora Skodvin, ‘“Pivotal politics” in US Energy and Climate Legislation’, *Energy Policy*, Vol. 38, No. 8 (2010), pp. 4214–23.

kind.¹¹³ Mutual economic benefits are to be gained from commercial joint ventures in the areas of vehicle production,¹¹⁴ transport fuel development,¹¹⁵ energy efficiency technologies,¹¹⁶ clean coal technology,¹¹⁷ coal-bed methane capture,¹¹⁸ and iron smelting technology.¹¹⁹ There are also opportunities for collaborative research in green innovation, CC&S, built-environment technology, and alternative energy R&D (wind, solar PV, solar thermal, etc.).

In addition to benefiting the American and Chinese economies, this agreement could also act as the catalyst necessary to inspire other strategic pairings, for example between Germany and India or Japan and Brazil. As Zhang emphasises, ‘in order to encourage developing countries to do more to combat climate change, developed countries should focus on carrots (not sticks).’¹²⁰ The appeal of encouraging strategic pairings between developed and developing nations lies in the competition it engenders among such national pairings. Stimulating competition in this way may inspire enhanced innovation and lower market prices for new technology, in the same way as heightened competition between firms gives rise to greater innovation and consumer surplus.

In regard to the USA and China, if either nation should be reluctant to engage collaboratively in exploiting synergies by leveraging the disparate strengths inherent in developed and developing nations, other far-sighted nations will be willing to fill the void. If not the USA, then perhaps Japan or Western Europe could slot in as a partner for China. If not China, then perhaps Brazil could fit the bill as a suitable partner for the USA. In other words, a bilateral agreement between China and the USA would be the ideal, but given adequate political will, similar pioneering collaborations could be established between any two developed–developing nation pairings. The incentive to approach collaboration in a proactive, expedient manner relates to the observation that there are first-move advantages associated

¹¹³ For support see Tora Skodvin, ‘“Pivotal politics” in US Energy and Climate Legislation’, pp. 4214–23; and C. Hedegaard, ‘Cancún Must Take Us towards a Global Climate Deal’, pp. 1–5.

¹¹⁴ Zhongxiang Zhang, ‘China in the Transition to a Low-carbon Economy’, *Energy Policy*, Vol. 38, No. 11 (2010), pp. 6638–53.

¹¹⁵ Scott Victor Valentine, ‘Towards the Sino-American Trade Organization for the Prevention of Climate Change (STOP-CC)’, pp. 447–74.

¹¹⁶ Carmen Richerzhagen and Imme Scholz, ‘China’s Capacities for Mitigating Climate Change’, pp. 308–24.

¹¹⁷ Zhongxiang Zhang, ‘China in the Transition to a Low-carbon Economy’, pp. 6638–53.

¹¹⁸ Ming Yang, ‘Climate Change and Energy Policies, Coal and Coalmine Methane in China’, *Energy Policy*, Vol. 37, No. 8 (2009), pp. 2858–69.

¹¹⁹ Shaojun Zeng, Yuxin Lan and Jing Huang, ‘Mitigation Paths for Chinese Iron and Steel Industry to Tackle Global Climate Change’, *International Journal of Greenhouse Gas Control*, Vol. 3, No. 6 (2009), pp. 675–82.

¹²⁰ Zhongxiang Zhang, ‘How far can developing country commitments go in an immediate post-2012 climate regime?’, *Energy Policy*, No. 37, 2009, pp. 1753–7.

with development of climate change mitigation technologies.¹²¹ The first national pairings to link up will enjoy these advantages.

In conclusion, if in an age of wicked, global problems, climate change boasts the pointiest hat and rides the biggest broom, the notion of bilateral partnerships between developed and developing nation pairings might just represent the ruby slippers that can get us home safely.

¹²¹ Scott Victor Valentine, 'Reframing Global Warming: Toward a Strategic National Planning Framework', pp. 31–62 in: Kheng Lian Koh, Lin Heng Lye and Jolene Lin (Eds.), *Crucial Issues in Climate Change and the Kyoto Protocol: Asia and the World* (Singapore: World Scientific Publishing, 2009).