

The Embeddedness of Earth System Governance in the International Political System: Towards a Geopolitics of Climate Change

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Amsterdam Conference on the Human Dimensions of Global Environmental Change

2-4 December 2009, The Netherlands

Conference Stream 6:

Theoretical and Methodological Foundations of Earth System Governance

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Abstract:

The dominant actors of earth system governance remain the world's major economic powers – due to their financial wealth, pool of scientific knowledge, and military-diplomatic capacities. Mainstream models of environmental cooperation (and our chosen case study – climate change governance) have often focused on an abstract, micro-economic logic of general state behaviour, making a functionalist-rationalist case for institutionalised global environmental cooperation that has tended to isolate the study of specific regimes from the wider international system. Another equally influential school of thought has applied institutionalist insights to explain the steady growth of international environmental regimes. But, in reality, the prospects for institutionalised co-operation wax and wane according to the prevailing political context and the disciplines of environmental diplomacy. One initial revision of mainstream approaches involves the analysis of the domestic political dynamics of the major players in the climate regime, particularly the US which acted as 'climate hegemon' in the mid-1990s and remains central even now. However,

while domestic variables can often be used to supplement existing approaches, international political circumstances require a greater willingness to apply new theoretical insights related to the structure of the international system of sovereign states. In short, this paper lays out a research programme that examines the way in which climate governance is embedded in the broader, structural patterns of world order. As the constructivist literature suggests, these structures may be ideational, such as dominant discourses promoting market-based rather than top-down technocratic solutions for climate change. Another powerful emerging discourse concerns the 'securitisation' of climate change and is likely to recalibrate the strategic rationality of policy-makers. It also highlights the fact that climate change has ceased to be an issue confined to the domain of 'low politics'. Consequently, with climate change ascending to the category of 'high politics', relevant international structures are also rooted in the dynamics of international power politics. Geopolitical factors have only occasionally been linked to earth system governance, although it is increasingly evident that some issues – such as state survival, societal well-being and energy security in the context of global climate change – have acquired significant *strategic* importance for negotiators around the world. The power shift from Northern countries to a group of emerging Southern leaders, heralding the advent of a multi-polar world order, has received insufficient attention with regard to the politics of global environmental change. Besides the relevance of power-related factors, there are equally important insights drawing on older realist traditions of thought that provide possible connections to the constructivist literature. These ideas go well beyond merely materialist interests of power- and wealth-maximisation to include, for instance, status and prestige as important motivations. Greater leadership on climate mitigation may thus be prompted by a desire for international recognition or internal legitimation.

Introduction

The governance of the global commons has been the object of academic study for several decades now. Once the domain of specialists, the promotion of regional or international cooperation on common pool resources or common sinks (Vogler 2000: 3) – such as the seas or the atmosphere – has steadily moved up the global political agenda because the stakes implicit in certain environmental changes (e.g. ozone layer protection, climate change mitigation, ocean acidification) greatly exceed the relatively limited ramifications of older agreements on regional fisheries or the management of deep seabed resources. The 2009 Nobel Prize for Economics,

awarded to a prominent student of the commons problematique, Elinor Ostrom (1990), underscores its centrality to global politics in the 21st century and the honour's timing is probably linked to ongoing political negotiations over climate change mitigation and adaptation. In many ways, the idea of earth system governance builds on the global commons literature, but further develops it by integrating a natural scientific focus on measurement, modelling and projection with the social-scientific task of translation, management, and political mobilisation/organisation. While conceptually convincing, theorists of earth system governance also highlight the practical problems of actually realising this synthesis. Besides the persistent uncertainties inherent in scientific modelling, the social-scientific side of the equation is dogged by "the complexity of relevant variables at multiple levels, human reflexivity, and difficulties in conceptualising key social concepts such as 'power', 'interest' or 'legitimacy'" (Biermann 2007: 328). Indeed, human reflexivity and the Weberian view of humans as eminently cultural (rather than rational-mechanical) beings greatly complicate the enterprise. Bringing the different sciences together in a joined effort of managing the global commons thus risks becoming a rather disjointed, interdisciplinary affair. This is partially mitigated by the propensity of some social-scientific approaches to emulate the natural scientific rationality of logical deduction and meticulous testing.

It is true that positivist-rationalist social science with its assumptions of atomistic actors, rational behaviour and utility maximisation has provided significant insights into the genesis and development of international environmental regimes, especially through the use of various game-theoretic models and the literature on neoliberal institutionalism. However, these approaches also obscure important, often non-utilitarian, sources of actor motivation that point, for instance, to the relevance of power-oriented behaviour or the quest for legitimacy and prestige/recognition. In its attempts to emulate the procedures of natural science, positivist-rationalist social science frequently adopts a narrow focus on the management of the earth system according to supposedly universal and rational laws of human (and state) behaviour, thereby underestimating the diversity of political contexts and the opportunities for alternative outcomes. Its problem-solving philosophy leaves little room for more historical, sociological, or explicitly 'political' approaches. Even if economistic logic could design an efficient and effective international regime on climate change, it is simply not enough to leave 'political' factors out of the equation. Rather than being dismissed as unfortunate stumbling blocs that can be overcome by the appeal of 'rational' thinking, these structural political 'realities' of international politics should be the building blocs for regime design (Heller 2008). For "[a]bove all there are 'political' factors upon which even the best and most rational schemes of regulation are dependent. Yet there is an evident disparity

between the scale and depth of the economic/technical/legal argumentation and the paucity of political analysis." (Vogler 2005b: 52).

The case of global climate change is clearly the epitome of contemporary commons problems. Whilst global environmental issues can be categorised in various ways – including transboundary and 'local-cumulative' problems (O'Neill 2009: 32f.) – those cases traditionally classed as 'tragedies of the global commons' arguably require the greatest amount of international cooperation and are most difficult to resolve. In this paper, climate change governance will therefore be employed as the central illustration and the academic insights gained are, to some extent, also relevant to the wider research programme on earth system governance. Upon sober reflection, the results of climate governance (and other environmental agreements) so far do not justify the heady atmosphere of the 1992 Rio Earth Summit where a new era of global environmental governance was proclaimed. The modest targets specified by the Kyoto Protocol are certain to be missed by a number of parties and the carbon emissions of many non-Annex I countries have grown dramatically since 1992.¹

Conceptualising climate governance in terms of an international regime further signals an emphasis on the cooperation of formally sovereign states rather than on various sub- and suprastate actors or structures of social and discursive power (cf. Okereke et al. 2009). This does not mean that the study of inter-state cooperation need not look beyond the visible world of official negotiations and publicly declared objectives, but it certainly accords special status to states as 'rule-makers' and legitimate representatives of their peoples in an international society of nation-states. In material terms, too, states are commonly the political agents with the capacity to ratify and implement international agreements. The environmental regimes in which they participate can be understood as "dynamic, sector-specific regulatory and administrative systems" encompassing formal accords, international organisations, private international law, and soft law or international norms of varying strength (Downie 2005: 67).

Initially, pursuing a conventional regime analysis, it is important to understand the status of climate change in the wider literature on global governance. Environmental problems have often been associated with the theory of collective action. The foundational work by Mancur Olson (1965) elucidates situations in which the self-interested action of individual or companies leads to market failure and thus prevents the production of a public good that would benefit everyone.

¹ The most populous non-Annex I countries with particular relevance for aggregate global carbon emissions, India and China, have seen increases in the region of 100-160%.

Some contemporary writers such as Grundig et al. (2001) and Stern et al. (2006) have taken an effective climate regime (producing climatic stability) to be a relatively pure public good: no party can be excluded from benefiting and the good is non-rival in the sense that one party's enjoyment of it does not detract from others' parties enjoyment. While this is clearly a useful way of framing the discussion, particularly for highlighting the problem of 'free-riding' by either poor or opportunistic countries, it appears rather too functionalist in its assumption of rationally convergent preferences in the conflictual realm of world politics. While everyone *should* have an overriding interest in achieving global climate stability, it is not the case that all parties are wholly persuaded by its urgency or prioritisation.

At the current time, therefore, it is better to characterise climate change as a 'common pool resource' (Luterbacher and Sprinz 2001; Davenport 2006) and, to paraphrase Hardin (1968), speak about a 'tragedy' of the atmospheric commons. Not only does this concept explicitly describe the struggle over scarce resources (atmospheric space being a rival good), but it also captures the sense in which avoidance of the tragedy of overexploitation requires the establishment of a 'common property regime' with relevant guiding norms and decision-making procedures (Ostrom 1990). The difficulty of realising this solution (or the alternative of hierarchical governance supplied by a hegemonic power) in the case of climate change has led to the alternative of privatisation: the emergence of emissions trading represents an embryonic market-based approach that still faces the challenges of quota allocation between countries and global enforcement.

As this analysis demonstrates, while there is a known underlying problematic, this does not translate into a straightforward, parsimonious modelling exercise. Both the conceptual definition and the details of the case study are essentially contested and have been interpreted in various ways in the literature. The attempt to develop general 'laws' of regime formation and implementation is a questionable enterprise, as "each case study has its specific characteristics" and every agreement hinges on a particular history and a set of circumstances that may not be mirrored by other environmental regimes (Kütting 2000: 21). Much questionable encouragement has, for instance, been drawn from the experience of the ozone negotiations, where the combination of scientific advice, US leadership, technological innovation, capacity-building, and financial compensation for developing countries led to a broadly effective and robust environmental regime. Given the pitfalls of direct comparison with other international environmental regimes and the specificity of each process of regime creation and implementation (ESRC 2000; Kütting 2000), it is best to treat the climate change regime as a novel case study in

its own right. Existing insights and theories of international cooperation should naturally be applied to it, but one should be prepared to admit their partial inadequacy and be open to new approaches.

Following this rationale, the first part of this paper will review the contributions of game theory and institutionalism to the analysis of climate governance. It finds that game-theoretic methods and assumptions about national self-interest (through cost-benefit calculation) correctly predict the relative stalemate in climate negotiations, but offer little hope for and few suggestions about how political progress could be made in the period after the Copenhagen Conference in December 2009. More hopeful guidance on international environmental has traditionally come from the institutionalist research, but climate change has long grown out of the domain of 'low' politics whose limited salience has often allowed cooperative dynamics to unfold. Having thus reviewed the dominant perspectives on climate governance, the second part of the paper outlines an alternative framework of analysis. To assess the potential for stronger international cooperation in the future, one needs to study both the domestic politics of the major powers and consider the ways in which the 'high politics' of climate change reflects, to a large degree, the structural changes within the international system, such as the decline of the US hegemon and the rise of Asia, the 'green leadership' strategy of the EU, and the return of geopolitical concerns over resources and long-term climate security.

(1) Mainstream approaches to climate governance

Rationalist and Game-Theoretic Approaches

The rise of quantitative and social sciences in the 1960s – generally conceived on the rationalist, parsimonious model of micro-economics – paved the way for several decades of infighting between two 'neo' schools of thought. While neo-realist and neo-liberal IR scholars agreed on many central premises of rationalist theorising, their dominance in the discipline also had the effect of "narrowing and often polarising our thinking about the sources of actor behaviour" (Breitmeier et al. 2006: 233). The 'neo' perspectives regard states as unitary actors, rationally pursuing the national interest and engaging in 'cooperation under international anarchy'. In the case of climate change, as well as many other global environmental issues, theorists assume that environmental protection (climatic stability) is in the common interest of all nation-states. They would also note, however, that the anarchical international system rewards the pursuit of short-term individualistic interests, thereby thwarting initial attempts at effective cooperation. As Steve

Smith (1993: 38) once remarked: "The international political system is not constructed in such a way as to make it in anyone's interest to act for the planet." The major difference between neo-realism and neo-liberalism lies in the relative vs. absolute gains debate (Baldwin 1993; Paterson 2000) and the neo-realist argument that cooperation will always be shaky and reliant on a hegemonic power. Staying true to the image of the market, neo-liberals have similarly contended that states act like atomistic individuals pursuing their self-interested ends. But this does not exclude the production of collective goods in the process – provided that a good regime design has put the right incentives in place.

Analytical frameworks employing game-theoretic rational choice perspectives to some extent supersede the debate of neo-realism vs. neo-liberalism which predominated during the 1980s. Many authors have since then described rationalist scholarship in terms of a 'neo-neo' synthesis which now squares up against more reflectivist/sociological and institutionalist variants of regime theory (Hasenclever et al. 2000: 7). Retaining the exclusive emphasis on rational self-interest and utility maximisation, but drawing on a variety of situations from harmonious collaboration to hard-headed bargaining, game theory imagines state actors as well-informed, coolly calculating strategists whose behaviour can be modelled and predicted. However, assuming "prior knowledge of interests and payoff structure" (Luterbacher and Sprinz 2001: 13) and using overly simplified, necessarily subjective, criteria of costs and benefits (Kütting 2000) does not only pose general methodological problems, but also seems ill-suited for climate change. In this environmental issue-area, a high degree of uncertainty regarding precise impacts and the frequent preference for short-term (and variously defined) gains undermines the notion of a genuinely rational choice (Paterson 1996: 104; Luterbacher and Sprinz 2001). Notwithstanding these deficiencies, game-theoretic models contain a number of insights that are worth exploring in more detail. Among the core findings generated in this research is a list of factors thought to facilitate international agreement by allowing rational state actors to pursue their desire for utility maximisation. In brief, an effective regime is more likely to emerge when (1) mutual interests exist and mutual gains are possible (referring to the structure of the particular game); (2) the shadow of the future is long (cooperation will be long-term and future benefits are highly valued); and (3) the number of parties is relatively small (the large-n problem complicates bargaining and enforcement) (Paterson 1996: 104; Rowlands 2001: 55).

Game theorists with neo-liberal inclinations tend to be drawn towards the models based on the 'Prisoner's Dilemma', in which participants will reap significant gains by cooperating, but could achieve even greater gains through unilateral defection. This dynamic is supposed to be

avoided by relying on iterated games and emphasising the importance of reputation for negotiating parties: 'tit-for-tat' behaviour can instead produce a positive dynamic of cooperation (Axelrod 1990). However, as Grundig et al. (2001: 160) aver, this 'supergame' model of iterated bargaining "identifies heavy discounting of future payoffs and uncertainty about benefits" as considerable problems. The emphasis on generous discounting is an attitude shared by many policy-makers, large sections of the public, financial markets, and many economists (e.g. Nordhaus 2008), while the doubts over benefits reveal both the unpredictability of climate change impacts and the often profoundly unequal distribution of gains from economically optimal cooperation (Davenport 2006: 10; Kverndokk and Rose 2008).

By contrast, in a different category of games – dubbed 'bargaining theories' (Grundig et al. 2001) – the assumption of underlying common interest (in climate stability) is retained, whereas much greater attention is paid to the distributive consequences of global cooperation. The particular anti-coordination game in question is often labelled 'Chicken' and involves actors trying to keep their nerve in the face of possible disaster (the tragedy of the atmospheric commons), which will occur if none of them gives in. The upshot of this is that those parties giving in too early will incur a moderate loss, whereas the other parties win a moderate gain, translating into a marked relative gain overall. Paterson (1996: 106) has rightly suggested that 'Chicken' may be much closer to the strategic imagination of certain negotiating parties. There is now a growing impression that China and India are using so-called 'commitment tactics' associated with this type of game, including an ethical discourse of Western historical responsibility, a hard-line negotiating tactic to extract maximum concessions, and a willingness to only compromise at the last minute.²

Pessimistic predictions

In the light of this discussion, it is perhaps not surprising that most of the major game-theoretical accounts of climate change negotiations come to a relatively sober and largely pessimistic conclusion by highlighting the preconditions not met by the current architecture. Those focusing on absolute gains in 'Prisoner's Dilemma' games are concerned about the opportunities for free-riding provided by weak monitoring and enforcement provisions. Given that climate stability can be seen as a non-excludable global public good, the threat of free-riding is a major deterrent to cooperation among the major powers, who are alert to the relative gains dimension, and a serious

² For example, most recently, Jennifer Curwood from the think tank E3G commented that, at the G8 meeting in July 2009, there was "a game of chicken going on, and people not wanting to blink first" (Living on Earth 2009). Similarly, senior US negotiator Jonathan Pershing likened US-China negotiations to a dance: "They won't move if we don't move, and we won't move, probably, unless they move" (BusinessDay 2009).

threat to the overall environmental effectiveness of the regime (Grundig et al. 2001: 165). The shadow of the future is not perceived as particularly long by many commentators, especially if considerable faith is invested in the development of radically more efficient technology or the deployment of geo-engineering techniques (e.g. Barrett 2007). Finally, the large number of parties and negotiating fora are only somewhat offset by the formation of negotiating blocs or coalitions.

Fundamentally, the pessimistic literature follows the logic of political economy, noting the disjuncture between rhetorical leadership and tough political action as well as the tendency of regime designs to reflect business-as-usual scenarios rather than represent serious policy challenges. The general "rarity of deep cooperation" (Downs et al. 1996: 389) is assumed in the predictions made and alternative strategies offered. Barrett (2007) thus observes that the anarchical international system is not a hospitable environment for limiting emissions. Accordingly, in the quest for an essentially self-enforcing climate change architecture, Barrett counsels falling back on 'soft' enforcement through 'naming and shaming' and more supply-side thinking through the coordinated pursuit of sustainable development. This is a new version of an easily defensible 'no regrets' policy. Once self-interest becomes the genuine driving force of cooperation, cheating and defection becomes unlikely and much lower levels of monitoring and enforcement are required (Hayes 1993: 336).

The Stern Review on the Economics of Climate Change, despite extensively drawing on game theory and neo-liberal assumptions of micro-economic behaviouralism, does not entirely share the excessive pragmatism of the above authors who all end up advocating a scaling down of political ambitions and a scaling up of technology as well as R&D cooperation. These are all measures that do not threaten economic growth and are largely immune to concerns about free-riding. Successful international cooperation, explain Stern et al. (2006: 451) , "requires that nations perceive sufficient benefits [...] and share a common vision of responsible behaviour." Building a bridge towards institutionalist approaches discussed later on, Stern et al. clearly disagree with the presumption that self-interest is (a) all there is to international cooperation and (b) a sufficient condition for the creation of effective regimes. Whilst they do not elaborate this aspect, they underline the need for ethical standards and a "broader vision" that incorporates a sense of community and "shared endeavour" (ibid.: 453). Furthermore, "[t]he barriers to action on climate change therefore included perceptions that country-specific costs of action dwarfed the benefits of action, and that was exacerbated by considerable uncertainty over the latter" (Stern et al. 2006: 453). It could well be argued that these cost-benefit *perceptions* are the real underlying

obstacles to further progress on effective climate governance and that a better understanding requires a look beyond schematic and overly rationalist game theory towards an analysis of domestic politics. Before exploring the domestic context, however, due attention should be given to what are traditionally more optimistic theories of international cooperation, drawn from the school of institutionalism.

Institutionalist Approaches

Besides rational self-interest and iterated 'games', further crucial ingredients for constructing an effective climate regime are international institutions and their organisational resources. Under contemporary conditions of 'complex interdependence' (Keohane and Nye 1977) and a globalising world marked by technological revolutions and transboundary environmental problems, there is bound to be greater reliance on the technical expertise and coordination opportunities offered by a growing network of more or less formal political arrangements and associated bureaucratic entities. In contrast to the realist assumption that international regimes will play a limited coordinating or catalytic role in international politics, institutionalists posit that regimes, and the rules and norms they embody, will both have autonomous effects and alter the behaviour of sovereign states (Vogler 2000). The latter point is frequently advanced by neo-liberal institutionalist scholars who highlight the powerful 'rational' motivation of and functionalist grounds for international cooperation (see Paterson 2006: 57-58; O'Neill 2009: 12).

'Weak institutionalism'

Although this often remains a 'thin' definition of regimes as useful tools controlled by governments, many institutionalist approaches go beyond simple game-theoretic premises by considering principles, rules, and mechanisms for the redistribution of resources, monitoring, and diffusion of information. These factors are instrumental in providing greater transparency, enabling parties to learn from each other, reducing transaction costs (by providing accurate information or introducing property rights), and, crucially, lower the risk of cheating from undetected free-riding (Hasenclever et al. 1997: 33-35). In these multiple ways, regimes are able to alter the interests of parties by offering new opportunities or changing incentives (Krasner 1982). Fundamentally, however, it has to be emphasised that such 'weak' institutionalist perspectives still assume that the effects of regimes do not imply the transformation of states' original goals such as security or economic welfare.

In the case of climate change, major policy documents such as the Stern Review on the Economics of Climate Change (Stern et al. 2006) and the Garnaut Climate Change Review (Garnaut 2008) follow a broadly neo-liberal and functionalist line of thought by proposing the building blocs of an essentially "rational *global* policy design" (Brennan 2009: 311, original emphasis). As the global public good of climate stability is not being provided – due to the dual challenges of international anarchy and market failure – inter-state cooperation must assume the task of constructing an adequate regime that corrects the observed deficiencies. However, the underlying weaknesses of 'weak' neo-liberal institutionalist approaches are, first, a largely apolitical understanding of the problem at stake. Regimes or organisations are said to "evolve as solutions to the opportunism, uncertainty, information costs, measurement problems, and difficulties of contract enforcement which plague arms-length market transactions" (Haggard and Simmons 1987: 507). Second, the "market analogy" of supply and demand for regimes with evident global relevance is only convincing in the realm of international politics when it begins from "old-fashioned interests" and thus loses its technocratic flavour (ibid.). Third, as Heller (2008: 136) notes, it can often be more promising to "adapt to existing [political] barriers than to hope for their elimination" and insist on the veracity of neo-classical economic analysis. In fairness, however, the Stern Review is careful to qualify its assumptions by repeatedly pointing to the need for "shared understandings" on long-term stabilisation goals and new international norms, thus building a bridge towards stronger institutionalist approaches.

'Strong' institutionalism

In contrast to 'weak' institutionalist analyses, 'strong' institutionalist perspectives allocate a significantly greater role to international regimes and organisations. Certainly, strong and weak institutionalist approaches do agree on an expansive range of functions provided by regimes – including those listed above. Coupled with the provision of negotiating frameworks and organisational resources, these functions are believed to contribute to a gradual convergence of views and objectives as well as to the building of mutual trust, the prevention of cheating and non-compliance, and the generation of guiding norms and principles (Vogler 2005a; O'Neill 2009: 72-76). Many of these elements have contributed to the relative success of environmental agreements in recent decades, most prominently to the ozone regime. Stronger institutionalist perspectives, even if they remain committed to neo-liberal precepts, emphasise the domestic and transnational political pressures that are building up in the context of international regimes.

At all stages of the policy process – agenda-setting, policy formulation, national implementation – international environmental regimes supply authoritative assessments which

allow domestic actors to exert political pressure, codify normative principles, transfer resources, and build transnational networks with both international and subnational organisations (Levy et al. 1993). These effects have also been evident in the case of climate change. Even before the UNFCCC was signed in 1992, key advisory and supportive international organisations (e.g. the IPCC or UNEP) have indirectly fuelled intra-state political mobilisation through the generation of knowledge or launching of initiatives and capacity-building. The 1997 Kyoto Protocol has become a focal point around which national debates have arisen and elections been fought, for instance the Australian federal elections of 2007 or the 2009 Japanese elections. On the other hand, most institutionalists emphasise that, ultimately, states retain overall control of international politics. Crucially, they will not sign an environmentally desirable agreement if it directly contradicts their interests (Vogler 2005a), may leave organisations and terminate agreements, or delay ratification until favourable amendments have been passed. Although Paterson (2009: 145) suggests that the embryonic European (and perhaps soon global) carbon market is another example of "institutional momentum" with a "quasi-autonomous dynamic", he equally concedes that it is still fundamentally *politically* dependent on stringent government targets for reducing carbon emissions (ibid.: 152).

Institutional bargaining

For genuinely 'virtuous' institutional dynamics to unfold, however, regimes and affiliated organisation not only need continuous support (from at least some important state and non-state actors), but also depend on a broad agreement on the environmental problem in question and acceptance of the 'constitutional contract' embodied in the institutional framework (Young 1994). Oran Young's model of 'institutional bargaining' offers the most developed and comprehensive account of the negotiation dynamics underpinning regime creation. Contesting rather "heroic" rationalist assumptions about pre-determined, stable interests, well-defined contract curves, solid factual information for all parties, safe knowledge about possible pay-offs and available negotiation strategies, institutional bargaining cautions against the overoptimistic predictions of many rationalist-functionalist scholars. "Governance systems", argues Young (ibid.: 18), "are not easy to establish; those engaged in interactive relationships commonly fail to solve collective-action problems, even when the mutual losses to be avoided or the joint gains to be reaped from doing so are substantial."

Young's model of institutional bargaining adds several important aspects to a broader analysis of regime formation and change, thus paving the way for a more thorough and multi-faceted assessment of climate governance. Among his most significant theoretical innovations are

the 'productive' utility of uncertainty (allowing for more 'integrative' bargaining results), the contribution of leadership (both power-based and entrepreneurial), and the importance of legitimacy to foster a sense of ownership and promote the internalisation of new rules and norms. Despite insisting on the interplay of multiple factors in the negotiations preceding regime formation, Young's theory of institutional bargaining tends to support the gloomy conclusions of most game theorists with regard to climate governance. Rather than leading to a form of 'integrative' bargaining that would foster a rudimentary consensus on the purpose and development of a global climate regime, most critical variables are likely to be weak or absent. According to Young (1994: 107), scientific knowledge and economic stakes make it relatively straightforward to distinguish between winners and losers from particular governance arrangements on climate change. One should therefore expect 'distributive' bargaining to predominate and – broadly in line with the geopolitical discussion above – seek to simplify and streamline the international negotiations.

Overall, institutionalist approaches – based on both weaker functionalist or stronger liberal premises – offer a less parsimonious but also more persuasive conceptualisation of international environmental cooperation. By bringing together technical-functionalist and political-normative considerations, they offer a more comprehensive account of how environmental regimes are created and maintained. It is no surprise, therefore, that they play a dominant role in the literature on environmental cooperation and earth system governance. However, despite their usefulness for many instances of international cooperation, it is doubtful whether they can make adequate recommendations for the future of international climate governance – even when joined by game-theoretic perspectives. Given the political salience of climate change politics, which is explicitly recognised by Young (*ibid.*), it is necessary to inquire more extensively into the significance of power and purpose in international politics. One major determinant of successful cooperation, for instance, are the domestic political conditions of the world's major economic powers.

(2) A political analysis of past and future climate governance

Domestic Politics

Somewhat forgotten in the trend-setting shift towards rationalist-systemic models of game theory and institutionalist perspectives, the study of domestic politics and environmental foreign policy has only recently been given the measure of attention it deserves (Barkdull and Harris 2002). The

blind spot of systemic IR theories lies in expecting "different states or individuals to respond similarly to the same structural constraints and opportunities; [in reality], much depends on past history, knowledge, and purpose" (Haggard and Simmons 1987: 511). To this list one should add more familiar elements of rationalist theorising such as domestic interest groups, bureaucratic actors, and external shocks such as economic crises. It should equally be pointed out that there exist game-theoretic renderings of domestic politics, most prominently the game of 'deadlock' (Davenport 2006: 9). This situation occurs when all parties perceive the cost of an agreement to outweigh the expected benefits and when, as a result, 'collective defection' becomes the default option. Davenport further suggests that global environmental issues are prone to this configuration because they are frequently characterised by strongly divergent interests which render an acceptable and effective compromise highly unlikely. In an international system dominated by sovereign states' concerns about 'high politics' (such as security) and economic growth (Smith 1993; Heller 2008), obstructive tendencies may prevail, particularly in developing countries with more urgent priorities, but also in states estimating their "ecological vulnerability" to climate change to be low (Sprinz and Vaahutoranta 1994). When climate change is perceived as both unimportant and exceedingly costly by a potentially hegemonic power like the USA, the chances of constructing an effective regime are dented even further, as the negotiations have to do without vital US financial and diplomatic leverage.

What rationalist-functionalist perspectives do not capture well is the idea of different deep core beliefs (Downie 2005: 78) and consequently divergent objectives which, besides ubiquitous distributive bargaining, can pose considerable challenges to any compromise agreement. Following rationalist precepts, the major accounts of the causes of 'deadlock' tend to focus on an overarching utilitarian cost-benefit calculation. In her study of US negotiating behaviour in climate change negotiations, Davenport (2006) notes that, in the final analysis, both American reluctance and the failure to achieve an ambitious global agreement are caused by a negative cost-benefit assessment which has only recently begun to look more promising. Earlier US insistence on more scientific research gradually gave way to an emphasis on uncertain and potentially ruinous economic costs. Shortly before the 1997 Kyoto Summit, new 'equity' objections were raised with regard to the lack of targets and timetables for major developing countries. In this framework, the idea of political change does not refer an alteration of political objectives. Rather, change signifies an altered structure of incentives. For instance, new scientific information about climatic impacts or significant technological progress would affect the utilitarian equation (Sprinz and Weiß 2001: 70). So would external economic shocks such as a steeply rising oil price (Esty 2007: 264).

Pluralism and cultural political economy

While these considerations are valuable starting points, there is a sense of dissatisfaction with the rationalist tendency to assume universally valid utility functions. By taking into account more varied elements of domestic politics, the drawbacks of excessive parsimony can be moderated, leading to more precise and issue-oriented explanations of countries' negotiating strategies. The best-known theory of domestic politics is arguably the school of pluralism and associated perspectives from political economy. Pluralists concentrate their attention on interest groups and social forces that dominate the national polity by exerting their influence on both governments and the public at large. Two major barriers have obstructed the efforts of social movements and NGOs in favour of stringent domestic climate legislation and renewed efforts for a global deal. First, other powerful actors, such as industry lobbies, have increasingly appeared on the scene. According to perspectives from political economy, the prospective costs of emission reductions are likely to be concentrated on small, but powerful constituencies, such as energy-intensive industries and energy companies, whilst the uncertainty of the scale and timing of future benefits, as well as their diffuse distribution among firms and consumers, fails to encourage sustained support from public interest groups (Hayes and Smith 1993: 11).

A second major obstacle are the divergent economic structures of capitalist systems around the world. Writers drawing on insights from cultural political economy have argued that some societies, notably the USA, face particular difficulties in adapting to a low-carbon lifestyle and economy. Paterson (2009: 148-49) thus theorises that the US-EU rift over climate change is fundamentally rooted in the opposition between two varieties of capitalism: ecological modernisation in Europe vs. 'carboniferous' capitalism in the USA. Whereas the former combines the promotion of low-carbon technologies and energy efficiency with strict emission targets, the latter has historically sought to 'out-compete' other economies by ensuring the availability of low-cost energy resources through high levels of extraction and production subsidies. For several reasons, the de-coupling of energy use from economic growth is not yet strongly being propagated in the USA: firstly, powerful economic actors have a vested interest in maintaining a highly consumptive society, while successive governments have cut public spending on R&D for new energy technologies (Davenport 2006: 192). Secondly, besides unfavourable US demographic and geographical characteristics, this form of economic organisation has a recursive relationship with lifestyles and cultural habits, such as popular expectations of car-based transportation, low energy prices, suburban sprawl, etc. which effectively lock in, both in terms of culture and infrastructure, patterns of living with large carbon footprints (DeSombre 2005:

187). In sum, in political-economic terms, the current tangible benefits of using comparatively cheap fossil fuels are widespread among both industry and the population. They may therefore pale against the substantial, but intangible future benefits of promoting a low-carbon economy.

Political systems and bureaucratic politics

Another strand of domestic politics analysis concentrates more narrowly on political-institutional features and considers two main categories: the political system and bureaucratic politics. Regarding the former, there is little available research of the impact of political institutions on climate change policy, but it appears that democracies are, in principle, a more congenial context for generating public concern and transmitting it to the executive, even if the 'policy output' of major democratic countries in the global North remains ambiguous for now (Bättig and Bernauer 2009). A customary transatlantic comparison tends to portray European political systems as more enabling environments. The US system is said to suffer from a strict separation of powers and "decentralised political institutions that empower small veto groups" (DeSombre 2005: 193). Europe, by contrast, is said to be blessed with both closer ties between executive and legislature (parliamentary democracies) and proportional representation which allows green parties to become participants in policy-making rather than remaining pressure groups only (Davenport 2006: 209). Ultimately, however, none of these factors looks decisive on its own. It is surely crucial that the political class is largely persuaded by the urgency of climate change mitigation and such a consensus has, to some extent, already been constructed in Britain (Giddens 2009).

A second category, bureaucratic politics, which analyses the inter-agency relations within government itself, remains equally under-explored in the literature. Given the need for a political system in which the institutions of government not only promote a 'third industrial revolution' of low-carbon technology, but also replace a one-sidedly materialist post-war economic philosophy with the integrated thinking of sustainable development, major institutional adjustments appear to be unavoidable (Hayes and Smith 1993). The study of bureaucratic politics serves as a reminder that this is not merely an exercise of political will and the economic logic of optimality. Heller (2008), in particular, makes a powerful case for harnessing the insights of organisational sociology. He highlights "the disconnection that now exists between the policy decisions made by sectoral authorities in national governments and the collective need to confront climate risks more immediately" (ibid.: 123). Governmental branches and agencies, Heller argues, tend to be self-interested actors defending their 'turf' against intrusions from new agendas and other agents. In the case of climate change, transport and energy ministries are likely to defend their regulatory

territory, while powerful finance ministries will balk at the implications of international agreements negotiated by their foreign policy or environmental counterparts.

However domestic politics is conceptualised, it is indisputably a major reason – some would say the principal reason – for the slow progress of climate governance. The key variable of international policy change, write Keohane et al. (1993: 14), is "the degree of domestic environmentalist pressure in major industrialized democracies." Stern et al. (2006: 464) similarly emphasise that "public understanding of the challenge of climate change is essential to create the political space for governments to introduce and sustain the policies that are required to make the transition to a low-carbon economy." Even many game theorists acknowledge that overcoming domestic obstacles "could be as important as defeating international free riding" (Barrett 2007: 253). In the USA, for example, many are hoping for the emergence of 'positive feedback loops' through which major economic lobbies swing behind a moderately ambitious national regulatory framework and then press for its internationalisation to ensure a level playing field in the global marketplace. This process may now be gathering pace³, but is not yet strong enough to transform the US political landscape.

International Politics and the Nature of Embeddedness

The consideration of domestic politics has significantly improved existing game-theoretic and institutionalist account of climate governance. However, as Davenport's (2006) rendering of the 'deadlock' game has showed, rationalist approaches, in particular, are not adept at grasping the *deeper structural* causes of dominant political attitudes which are, for instance, ably examined by scholars working on cultural political economy. Institutionalists are, on the whole, too busy demonstrating the autonomous impact of international institutions and the virtuous dynamics of 'institutional bargaining' to ground their analyses in the wider geopolitical environment. Pursuing a more 'political' exploration of the problem of international cooperation, there are a number of avenues that might be pursued in considering how the climate regime is embedded in the wider international system. They need to be matched to appropriate research strategies and methodologies. Two are taken up in the conclusion to this paper which may be regarded as a tentative research agenda. First, there is the ideational dimension of how the climate regime has

³ Sensing the commercial opportunities for efficient forward-thinking energy businesses under future cap-and-trade legislation, Jim Rogers, the CEO of the third-largest American energy company (Duke Energy), has come out strongly in favour of proposed new regulations (Kirby 2009). As of September 2009, an increasing number of energy and technology companies have been leaving the U.S. Chamber of Commerce in protest at its campaign against domestic cap-and-trade legislation (Entine 2009).

responded to shifts in the wider international order and, in particular, the extent to which it has been characterised as 'high politics'. The relevant strategy here, given the subject matter, would rely upon the analysis of changing discourses being underpinned by an essentially constructivist outlook. The second avenue is related, but requires an altogether different approach deriving from geopolitics and a concern with the international power structure usually associated with realist scholarship. This attempts to investigate the extent to which the climate regime has been consonant with and determined by shifts in the overall power structure. Both lines of investigation, although utilising quite distinct methodologies, may lead to a set of common conclusions that distance the climate regime from the established findings and predictions on international environmental cooperation. There is also the implication that the motives and characterisation of the issues by participants will also be rather more complex.

Ideational embeddedness

From a constructivist perspective, the norms and principles of international regimes may be expected to reflect the character of the wider international 'order' in which they are embedded (Young 1994: 52; Vogler 2000: 30; Breitmeier et al. 2006: 4). In the longer view, it is possible to trace various examples. Part XI of the 1982 UN Law of the Sea Convention that attempted to govern the exploitation of the deep seabed according to the new principle of 'common heritage' was very much a product of structural and redistributive ideas – the New International Economic Order (NIEO) – that were prevalent in the late 1960s and 1970s. This partly explains the extended failure to ratify the Convention once the political climate had changed in the 1980s. After 1989, the entry into force of the seabed provisions was only secured by drastic revisions and the introduction of text on the importance of free markets. Similarly, one could observe shifts in the political framing of the norms and principles of the climate regime which inevitably reflected an international order transformed by the ending of the Second Cold War. There is a stress on the pre-eminence of free and open markets (as opposed to notions of common heritage) and marketised solutions notable in the design of the Kyoto Protocol. While these principles might be said to reflect the international order emerging in the late 1980s (Bernstein 2000), there is also a need to understand subsequent changes reflected both in discursive shifts and most significantly the place of climate change in the international issue hierarchy.

There is clearly a difference between the way the climate regime is treated politically that sets it apart from other environmental regimes, important as they may be. Most of the latter remain determinedly 'low politics'. They generally have a functional character, are often the near exclusive preserve of national technical specialists and exist 'under the radar' of the world's press.

Thus there may be very little political comparison between the climate regime and enterprises such as the Rotterdam Convention on Pesticides and Industrial Chemicals (PIC) and the Stockholm Convention on Persistent Organic Pollutants (POPs) or even the 1979 Convention on Long-range Transboundary Air Pollution (LRTAP). Perhaps, one of the problems with the environmental IR literature is that it does not usually make such distinctions. The climate regime was formalised at the 1992 Earth Summit and since then has become increasingly subject to 'high politics'. This requires investigation because it may provide the key to understanding why some of the approaches to and explanations of earth system governance, which are generally applied to other environmentally problems, fit awkwardly with climate regime.

One way of measuring the extent to which climate has acquired 'high politics' status is to examine attendance at the Conferences of the Parties (CoPs) and in particular their 'high-level' segments. At what points and with what degree of regularity do more senior ministers appear and ultimately heads of government – as appears to be the ambition of the UK government for the Copenhagen CoP (Gordon Brown 2009). The political dynamics of commitment by government leaders may be significant in so far as it ensures that major meetings cannot be allowed to terminate without some form of 'success'. Much more important is the extent to which such involvement, often at the 11th hour, serves to break deadlocks. Another indicator of 'high politics' status may be provided by the placing of climate issues on the agenda of other significant negotiations. Here the role of climate G8 and now G20 discussions merits study. At least from 2005 and perhaps before, climate issues have held a primary place on the G8 agenda alongside a more long-running concern with energy issues. An analysis of the G7/G8 agenda back to the 1980s would test this proposition. In a sense, the achievement of 'high politics' status involves the expansion of climate issues beyond the strict confines of environment ministries and the specialised apparatus of the UNFCCC and Kyoto Protocol to foreign ministries and chancelleries and high profile events such as G8 meetings.

The other linked dimension of ideational change is to be sought in discursive shifts in the framing of climate issues. 'Securitisation' of the climate clearly involves the ascription of 'high politics' characteristics. High politics is essentially defined as being about those matters of security and national prestige that were the preoccupation of classical statecraft. There has, of course, been an academic and policy debate about the exact linkages between conflict and environmental degradation that extends back to the period before the inception of the climate regime (e.g. see Ehrlich 1969). There was also a debate, attendant on the ending of the Cold War, about the re-definition of the concept of security to include an absence of environmental threats

to human well-being (Deudney 1991; Homer-Dixon 1999; Dalby 2009). Much of this discourse was abruptly halted by the events of 11 September 2001 after which national security tended to be rather rigidly defined, in Western capitals at least, in terms of terrorism, failed states and weapons of mass destruction. However, there has been a more recent trend to locate climate within a national security discourse – something that has certainly been evident in the UK Foreign Office's approach. The formal outcome was a decision to bring forward a climate resolution at a Security Council meeting in April 2007 (Detraz and Betsill 2009). Apparently this was not merely an academic exercise, but on the model of a previous resolution on HIV/AIDS, was intended to have an impact on the ongoing climate negotiations.

Structural Change

The climate regime developed from the late 1980s, in parallel to the most profound changes in the structure of the international system. The modified bipolar structure of the Second Cold War had by the early 90s become the United States' unipolar moment. Subsequently, it became clear that, in economic terms at least, the rapid growth of China and some other major countries (e.g. Brazil, India, Russia) was shifting the underlying structure away from the previous predominance of the United States and Europe towards the east (Layne 2009). This was clearly evident in GDP figures but also in carbon dioxide emissions. In respect of the international power structure, the position was complicated by the continuing and unequalled military dominance of the US, but the shift in the geopolitical landscape was indicated in various ways – notably the emergence of the G20 and the recognition that the dominant role in the world political economy could no longer be assumed by the formerly industrialised nations of the G7. All this also had implications, of course, for the continuing unity and viability of the Group of 77 (developing) countries in the UN system.

These geopolitical shifts are as momentous as they are difficult to define precisely. It is inconceivable that they did not impact upon the development of the climate regime which, as argued above, was not in a functional backwater of global politics. Nonetheless, it may well be that the effect was limited or counteracted by the kind of institutional dynamics that has been such an important part of the liberal explanation of international cooperation. Power-structural analysis is, of course, the province of realist theory in International Relations. Other than denying the significance of much international institution building, the realist insight on climate cooperation would derive from the hegemonic stability thesis and the requirement for hegemonic leadership. The non-engagement, indeed active hostility, of the hegemonic power over most of the period in which the UNFCCC regime was constructed poses a problem (Vogler 2000: 189;

Rowlands 2001: 46). Equally, the EU in its role as saviour of the Kyoto Protocol after the breakdown of exchanges with the US in 2000- 2001, is nonetheless in realist eyes a most unlikely hegemon. These paradoxes might be resolved by arguing that for most of the period under consideration climate did not have the status of high politics and that the US did not need or care to bring its weight to bear or we may simply regard the hegemonic stability thesis as being falsified in this instance. Nonetheless, there has been continuing concern that without the United States or possibly without some form of global deal between the old hegemon and the rising Chinese power there can be no renewed and effective international cooperation to reduce greenhouse gas emissions. At one of the regular 'US-China Strategic and Economic Dialogue' meetings in July 2009, President Obama boldly predicted that relations between the two nations would shape the 21st century, emphasised their common interests, and called on the Chinese to strive for a comprehensive climate deal at Copenhagen⁴. To the chagrin of European negotiators, who fear a new and less ambitious leadership alliance (Broder and Kanter 2009), the heightened and increasingly friendly US-China diplomatic activity reflects a shared sense that the balance of power has been recalibrated. But the crucial difference with the Bush administration is that Obama's more pragmatic strategy looks towards greater collaboration rather than a forceful restoration of unipolarity.

Much discussion remains speculative because there is an absence of knowledge about the precise fit between shifts in the international power structure and the evolution of the climate regime. This presents a set of empirical questions which would link the former to the latter. While there is a literature (e.g. Corbetta et al. 2008; Wohlforth 2009), it would be necessary to research the micro power structure within the climate regime. Who were the key players at particular points in its development and were their patterns of alignment relatively stable? Which actors regularly form part of the relatively small group consulted on the shape of the final bargains that have emerged from the various CoPs? A geopolitical proposition would hold that there is some congruence between the overall international power structure and that within the regime. Conversely, the institutionalist case would be strengthened if there was little or no match. An intermediary position is taken up by Krasner who dismisses conventional realist attempts at 'reading off' institutional developments from the international power structure. He argues that "[a] change in power distributions does not always imply a change in outcomes because regimes may

⁴ In his speech, Obama said: "Let's be frank: Neither of us profits from a growing dependence on foreign oil, nor can we spare our people from the ravages of climate change unless we cooperate [...]. Common sense calls upon us to act in concert" (Geman 2009). US Energy Secretary Steven Chu went even further by declaring: "What the U.S. and China do over the next decade will determine the fate of the world" (Grunwald 2009).

function as intervening variables. Regimes may assume a life of their own, a life independent of the basic causal factors that led to their creation in the first place" (Krasner 1982: 499). Following this perspective, the structural might wielded by the great powers in the international system takes the shape of 'tectonic plates' which only realign themselves gradually (though this can also lead to momentous 'earthquakes').

The Character of the Issues

It is, nevertheless, possible that the assumptions used by standard accounts of rational, interest-based behaviour in international environmental cooperation require some modification. The cognitivist account of regime development already does to an extent, particularly with reference to the interface between science and policy (Haas 1990). However, one may ask the question what are the consequences of the embeddedness discussed in the previous paragraphs for assumptions about motivation and national interests? There is already some realist-inspired work on this dealing with a previous era in which newly independent nations sought involvement in the reform of global commons regimes in line with the 1970s campaign for a New International Economic Order (NIEO) (Krasner 1985). Here the point is made strongly that it is difficult to establish any additional material gain that many of the participants would have received from the positions that they adopted – as compared to a strategic accommodation to the prevailing international order based on US-led liberal trade regime. Instead, the actual motivation of developing countries were the assertion of national sovereignty and the reinforcement of an emergent statehood, as well as stable financial resources through the creation of authoritative (rather than market-based) regimes of allocation. Certainly, similar connections might be made between prevailing North-South politics and the development of the climate regime. The 'high politics' characteristics of the climate regime invites participating governments to engage in the pursuit of prestige in ways long recognised in the realist literature (Morgenthau 1954) but usually absent from treatments of environmental regimes. States hosting CoPs often have a commitment to their success and probably the best example of this is provided by Japan for whom the naming of the Kyoto Protocol appears to remain significant. For many Japanese, it "became a symbol of the pressing problem of global climate change and Japan's bid to be a larger foreign policy player and a leader in global environmental protection" (Tiberghien and Schreurs 2007: 78), thus thwarting the attempts of powerful domestic business lobbies to dampen the country's enthusiasm for costly new regulations.

Climate leadership, a mantra continually repeated by the European Council, also has a manifest political function in building the global identity of the European Union (in contrast to

the 'US other'). There is a potential connection here to work on international status hierarchies and the implications of status inconsistency for major powers (Corbetta et al. 2008). The point is that the motivations of state governments engaging in climate cooperation are likely to be quite complex and related to status and legitimacy issues as well as more obvious economic costs and benefits. The 'shaming' of the US and its decision to 'join the consensus' at the final Plenary of the 2007 Bali CoP provides one instance as does the kind of publicisation of commitments that has preceded Copenhagen. These may be regarded as a part of an extended game of diplomatic game of 'Chicken', but there are also important status considerations in play. China has officially recognised its responsibility as a major power to its people and to the world at large (Borger and Goldenberg 2009), and even India – until now veering between hesitation and polemical hostility to a comprehensive bargain at Copenhagen – has become somewhat more pragmatic, recognising its vulnerability to climate change and wishing to be regarded as "part of the solution" (Yardley 2009). It will be the task of successful international climate diplomacy (as well as civil society campaigning) to strengthen the ideational links between power, prestige, responsibility, and concerted action.

Conclusion

As the above discussion has demonstrated, there is a genuine need for constructing new theories of international climate governance. The institutionalist literature on earth system governance cannot easily cope with the 'high politics' status of climate change, whilst conventional game-theoretic approaches rely on questionable rationalist premises and lead to exceedingly pessimistic scenarios for the future. The latter may well be correct in the short term, especially regarding the outcome of the Copenhagen conference, but they are an unreliable guide to longer-term developments and opportunities, not promoting concerted international action but a 'no regrets' approach of sustainable development propped up by the hope for geo-engineering options. Instead, an explicitly political analysis of climate governance can take account of both significant obstacles and opportunities. The domestic political context of the world's major economic powers is central to the fortunes of the climate regime, but it needs to be complemented by an analysis of international dynamics which equally impact on the formulation of a country's foreign policy. Global ideas and discourses, for instance related to 'climate commodification' or 'securitisation', clearly shape policy-makers' perceptions of the issues at stake and thus structure the options for political action. At the same time, there is a revival of older geopolitical and realist currents of thought which are sensitive to a shifting balance of power. Climate governance, as a topic of

'high politics', has become bound up with salient questions regarding military security and geo-economic competition.

Whilst warnings of a new – ecologically ruinous – 'power game' are entirely legitimate, increasing geo-ecological and geo-economic interdependence could equally give rise to deeper practices of cooperation. Rather than merely relying on power politics as usual or engaging in strategic games, as rationalists would assume, the development of the UNFCCC has witnessed states actively seeking to construct a new set of international norms to govern their geo-ecological relations (Paterson 2000: 15), perhaps paving the way for a more fundamental 'greening' of state sovereignty and identity in the future (Litfin 1998). But apart from such longer-term structural cognitive change, even 'power politics' can make a significant contribution to effective climate governance because it is (a) unavoidable, as Morgenthau (1954) correctly believed; (b) potentially helpful because it prioritises the long-term security of the state by adopting a precautionary attitude; and (c) indispensable because it can formulate the compromises upon which countries can build a globally operating agreement.

A geopolitical lens initially directs attention to familiar conflicts of interests and distributive concerns, which have dogged the climate negotiations since the very beginning, but it also goes beyond game-theoretic approaches by encompassing classical realist practices of strategic thinking, such as long-term forecasting, pessimistic prudence, and the strengthening of national autonomy and resilience. While the context of domestic politics should always be considered alongside geo-strategic aspects, policy-makers are prone to bolder decisions when the core attributes of the state are concerned, such as sovereignty and state survival (Vogler 2005a). Critics have, however, pointed out that the idea of peaceable and normatively desirable practices of geopolitics is based on scarce historical evidence. An answer to these objections can only be adumbrated here for reasons of space. First, if heightened and damaging military and economic rivalry between the great powers were genuinely inevitable, the emerging framework for US-China cooperation would be difficult to explain. Furthermore, once there is a measure of agreement on a stable or transformed world order, there have historically been instances of cooperation even during the Cold War, for example agreements on arms control that appeared to be in both parties' interest (Giddens 2009: 223). In a similar vein, we could regard the management of "mutual vulnerability" as a powerful shared motive for constructing environmental regimes (Vogler 2000: 197).

The power-based approach to regime theory advocated by Krasner (1982) can therefore, in principle, describe both dynamics of bargaining deadlock and a more progressive oligarchy. The

latter could, for example, be represented by a new forum of the twenty greatest carbon polluters (representing about 88% of total emissions) which could resolve the most critical disputes before proceeding with the established multilateral channels (Giddens 2009: 221). As suggested in the above discussion, it will also be vital to encourage the pursuit of prestige and status in the domain of climate change mitigation. However, a precondition for such a 'virtuous' political dynamic is an updated conception of environmental security based on an acknowledgement of global scientific consensus (and the even more disquieting uncertainties about tipping points and rapid climate change). Policy-makers would have to recognise that state security and human well-being cannot be ensured in a world that had entered a spiral of climatic turbulence or even runaway global warming. This may imply adherence to a new security paradigm charting a move "from conflict-control to conflict-prevention" (Rogers 2009), and, to some extent, from divisible to an 'indivisible' or 'common' security embodied by transboundary and indiscriminate environmental dangers (Halden 2007: 153-54).

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