Frameworks for International Climate Governance: Assessing the Alternatives

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Recent climate negotiations have evinced a controversial debate on how best to reform the institutional and legal framework of international climate governance. While this discussion on competing governance architectures is by no means new, it has rarely been pursued with the intensity prompted by the latest negotiating mandate adopted at the Durban Climate Change Conference in 2011. Unlike the domestic policy context, where widely recognized criteria have evolved to guide choices among alternative policy frameworks, no equally systematic approach has yet been developed for the international arena. Although inevitably prone to normative contingency, such criteria can offer a heuristic tool by which the defining characteristics of different governance approaches are identified and rendered mutually comparable. Building on a survey of existing research, this article develops a matrix of criteria for the assessment of contending frameworks of international climate governance.

Introduction

After almost two decades of negotiations, the momentous summit held in Copenhagen in December 2009 marked a watershed moment for international climate cooperation. Many observers pointed to this summit and its outcome as evidence that the international climate regime was in need of fundamental reform, while others defended the status quo and blamed any failure to achieve meaningful progress on the complex issues at stake or the political maneuvering of individual states. A heated and controversial debate followed in the wake of the Danish negotiations, evincing a broad spectrum of proposals on how best to reform the institutional and legal framework of international climate governance. More recently, at the 2011 climate summit in Durban, South Africa, the international community appeared to lay out a clearer path to the future climate regime, although the broadly stated mandate of reaching agreement on a "protocol, another legal instrument or agreed outcome with legal force" by 2015 (UNFCCC, 15 March 2012) still leaves central questions of architecture and regime design unanswered. And the discussion continues, with suggestions that range from various elements of formal, legally binding, and centrally organized authority to informal, voluntary, and decentralized approaches to climate governance.

While this discussion on competing governance architectures is by no means new,[2] it has rarely been pursued with the intensity prompted by what many considered a failure of classical multilateralism at the Copenhagen Climate Negotiations. In the relatively short time since that summit, a large number of recommendations and reform proposals have been introduced into the debate, typically guided by a particular ideological outlook or epistemic interest. Unlike the domestic policy context, where widely recognized criteria have evolved to guide choices among alternative policy frameworks, no equally systematic approach has yet been developed for the

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2. See, for instance, Aldy and Stavins (2007); Aldy and Stavins (2010).

international arena, where narrow state preferences or a specific methodology tend to dominate the discussion.[3] Drawing on lessons from the evaluation of domestic climate policies and measures as well as the study of broader international environmental governance, this paper defines a matrix of criteria for the classification of alternative frameworks for international climate cooperation. For this purpose, it approaches international climate cooperation in the broadest sense, covering architectures, regimes, and institutions,[4] and including venues for political negotiation as well as technical cooperation and exchange. Ultimately, the analysis hopes to facilitate a more transparent and systematic approach to the assessment of alternative frameworks for climate cooperation.

Diagnosis: Evolving Frameworks of International Climate Cooperation

A Brief Retrospective

Calls for concerted international action on climate change date back more than two decades. When in 1988, the United Nations (UN) General Assembly declared global warming a "common concern of mankind,"[5] it paved the way for formal negotiations[6] under the auspices of the UN, ultimately resulting in the adoption of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992.[7] A milestone in early climate cooperation, the UNFCCC entered into force on 21 March 1994 and has since been ratified by 195 parties, affording it one of the broadest memberships of any international agreement.[8] Given the need for unanimous consent,[9] however, broad participation translated into substantive commitments that were largely programmatic in nature; the adoption of more specific obligations had to be deferred to a subsequent instrument.

By late 1997, the international community had adopted the Kyoto Protocol,[10] a separate instrument under international law that required ratification by a sufficient number of signatories before it could enter into force.[11] Nearly a decade after its adoption, and only narrowly meeting the criteria for an entry into force, the Kyoto Protocol took effect on 16 February 2005, albeit without the backing of the largest greenhouse gas emitter at the time, the U.S.

While the protocol marked an important step in climate cooperation, its practical effect was described as narrow, thin, and ultimately symbolic (Victor, 2001; Bell, 2006; Böhringer

3. Relevant criteria have been proposed by Aldy et al. (2003), Bosetti et al. (2008), Bodansky (2004), Keohane and Victor (2010), and Moncel et al. (2011), and will be amply referenced throughout this paper; still, the focus of these studies does not rest on the elaboration and assessment of criteria as such, but rather on providing a reference framework for the substantive proposals assessed in each study. See also Stewart (2007): 148 ("still in an early stage").

4. In the debate on international climate cooperation, notions such as "architecture," "institution," and "regime" are used recurrently, although often without a clear or authoritative definition. An "architecture" may be understood as an "overarching system of public and private institutions, principles, norms, regulations, decision-making procedures, and organizations that are valid or active in a given issue area of world politics" (Bierman et al., 2009: 15). Defined thus, "architectures" differ from "institutions" and "regimes" primarily by virtue of their broader scope, which extends beyond solving only a particular governance challenge. Accordingly, "institutions" are typically approached as sets of rules stipulating ways in which states and other actors on the international plane should cooperate (Mearsheimer, 1994: 8; Martin and Simmons, 1998: 729). Closely related are regimes, which have been described as "implicit or explicit principles, norms, rules, and decision-making procedures around which actors' expectations converge in a given area of international relations" (Krasner, 1982: 185; Haggard and Simmons, 1987: 491). A common feature of all three concepts is their permanence, that is, their ability to transcend individual actors, decisions, and interests.

5. Protection of Global Climate for Present and Future Generations of Mankind, UN General Assembly Resolution 43/53, 6 December 1988, endorsing the establishment of the Intergovernmental Panel on Climate Change (IPCC).

6. Protection of Global Climate for Present and Future Generations of Mankind, UN General Assembly Resolution 45/212, 21 December 1990, which established an Intergovernmental Negotiating Committee (INC).

7. On the negotiations, see Bodansky (1994): 45; Goldberg (1993): 244–51; Sands (1992): 270.

8. United Nations Framework Convention on Climate Change (UNFCCC), New York, 9 May 1992, in force 21 March 1994, *International Legal Materials* 31 (1992) 849; the status of ratification is available at unfccc.int/essential_background/convention/status_of_ratification/items/2631.php, accessed 15 January 2013.

9. On the role of unanimous consent and its problematic consequences for international environmental governance, see already Palmer (1992): 270–78.

10. Kyoto Protocol to the United Nations Framework Convention on Climate Change (Kyoto Protocol), Kyoto, 10 December 1997, in force 16 February 2005, *International Legal Materials* 37 (1998) 22.

11. Under Article 25 (1) of the Kyoto Protocol, it was to enter into force once fifty-five states "deposited their instruments of ratification, acceptance, approval or accession," on the condition that those states account for at least 55 percent of the 1990 CO_2 emissions by developed states.

and Vogt, 2004). Because the quantified emission limitation and reduction objectives (QELROs) for developed countries specified in the Kyoto Protocol set to expire in 2012, its governing body immediately adopted a mandate to negotiate new commitments by its parties. This mandate had to account for the divergent membership of the UNFCCC and the Kyoto Protocol, forcing the negotiations to proceed on two separate, yet overlapping tracks with distinct bodies and procedures.[12] Also, the difficulties experienced in its negotiation and ensuing ratification prompted the emergence of new channels for international engagement on climate change, including several regional and bilateral initiatives,[13] further increasing the complexity of international climate cooperation.

By December 2007, discussions under the UNFCCC and Kyoto Protocol had progressed sufficiently to adopt a more sophisticated mandate, the Bali Roadmap, which called for a focused process to conclude two years later.[14] When leaders from around the world converged in Copenhagen in December 2009, the parallel negotiation processes had failed to narrow down potential options sufficiently to allow for passage of an international agreement in the tradition of the UNFCCC or the Kyoto Protocol. Instead, in an atmosphere of tension and mistrust, a group of heads of state and government elaborated a new document that was sufficiently vague to meet with the approval of nearly all dissenting factions.[15] Given the absence of alternative options, a majority of states agreed to "take note" of the ensuing Copenhagen Accord, with several parties censuring its lack of ambition and the undemocratic process in which it had been adopted.

Although parties soon resumed the negotiations following this traumatic summit, it was clear that faith in the UNFCCC regime had been severely shaken. Only when measured against significantly lowered expectations can the subsequent climate summits in Cancun and Durban be considered a success and, as some observers claim, a new lease of life for the UNFCCC negotiations (Oberthür, 2011: 5; Rajamani, 2011: 519). While some progress has been made on specific issues such as the institutional arrangements for climate finance and technology transfer, more divisive issues, such as the legal form of a future climate agreement and the extension of commitments under the Kyoto Protocol, remain controversial.[16] As the 2012 climate summit in Doha, Qatar, showed these very questions are what threaten to again unravel diplomatic progress, and it is all but evident that international climate cooperation will continue to be driven at more levels than the UNFCCC and the Kyoto Protocol.

Alternative Scenarios for Future Climate Cooperation

In many ways, the Copenhagen summit of 2009 marked an important departure from the practice of multilateral climate cooperation over the previous two decades. Although fissures had become visible at earlier stages in the negotiations, international engagement on the issue reached a new dimension of political controversy, yielding a compromise that was merely "taken note of" rather than formally adopted. At least in part, this document can be understood as a reaction to the challenges faced in achieving universal agreement on an international treaty, presupposing that its adoption be individually rational at acceptable cost to all parties (Lane et al., 2008: 33). Yet in doing so, recent events have also given new momentum to an

12. For details, see Bausch and Mehling (2006).

13. Such initiatives include informal partnerships and more formal forums on a variety of technical issues (e.g. the Global Methane Initiative, the Carbon Sequestration Leadership Forum, the International Partnership for a Hydrogen Economy, the International Carbon Action Partnership, the (no longer active) Asia-Pacific Partnership on Clean Development and Climate, or the International Renewable Energy Agency Methane) as well as various high-level ministerial dialogues (Dialogue on Climate Change, Clean Energy, and Sustainable Development of the Group of Eight (G8) Industrialized Nations, Major Economies Forum on Energy Security and Climate Change (MEF), or Group of Twenty (G20)); for an overview and analysis, see Bausch et al. (2013); Biermann et al. (2009): 21–24; de Coninck et al. (2008); Michonski et al. (2010); Vihma (2009).

14. See, in particular, Decision 1/CP.13, FCCC/CP/2007/6/Add.1, 14 March 2008 ("Bali Action Plan").

15. Decision 2/CP.15, FCCC/CP/2009/11/Add.1, 30 March 2010 ("Copenhagen Accord").

16. See Rajamani (2011): 500.

earlier debate about the merits of alternative regime architectures, giving rise to a number of conceptual proposals for the negotiation process.[17] In an attempt to structure this debate, such proposals have often been framed as falling along a continuum, with one end representing the traditional "top-down" approach to international climate cooperation, the other end a "bottom-up" aggregation of nationally or regionally defined efforts (Bodansky et al., 2007: 1).

As mentioned earlier, arguably no regime as complex as that governing climate cooperation can be easily assigned to either extreme, with features typically ascribed to one approach also present in the other (Dai, 2010: 633–634); still, the distinct shift marked by the Copenhagen Accord and preoccupation with this conceptual dichotomy in recent literature warrant a closer look at the proposed distinction between "top-down" and "bottom-up" approaches to climate governance.

Keeping with the foregoing characterization, a "top-down" approach is primarily based on formal engagement between sovereign actors (usually states) along traditional channels of multilateral diplomacy. Such negotiations are expected to result in binding international commitments adopted through an international treaty, often complemented by centrally integrated processes and hierarchical institutions, which in turn shape and drive domestic implementation efforts. Under a "bottom-up" approach, by contrast, countries retain the ability to define both the nature and scope of their climate efforts; while they may cooperate with other partners by coordinating their activities and defining common aspirations, decision making remains decentralized and focused on the national level rather than being assigned to a specific international institution. International climate cooperation then largely occurs through fragmented institutions with no identifiable core and weak or nonexistent linkages (Keohane and Victor, 2010: 3–4).

Proponents of "bottom-up" approaches highlight the importance of flexibility, which they believe will allow each actor to define priorities that are technically, economically, and politically acceptable in light of local or regional conditions. By avoiding the cumbersome process of international law and its requirement of unanimous consent, "bottom-up" cooperation is thought to lower the threshold for meaningful progress, allowing similarly minded actors to form coalitions and take action that accommodates their individual circumstances and specific interests. Unlike conventional diplomacy, such informal approaches might also avoid the conservative tendency of legally binding arrangements, which are apt to lock in low levels of ambition and prove vulnerable to defection (Victor et al., 2005: 1820).

Once underway, the resulting cooperation is expected to develop in an organic manner as parties explore new forms of governance and gradually increase their level of commitment. Perhaps most importantly, advocates doubt the very ability of a "top-down" architecture to address the climate challenge, as it underestimates the underlying complexities and overestimates the willingness of decision makers and stakeholders to act; rather, action should occur at the same level as the causes and effects of climate change, which is the local level (Rayner, 2010: 616).

As a direct corollary, however, "bottom-up" approaches are thought to afford less certainty and reciprocal confidence than a formally binding "top-down" agreement, potentially deterring some actors from adopting commitments without assurance that others will engage in similar efforts (Hare et al., 2010: 607; Pew Center on Global Climate Change, 2005: 19). Without a single overarching framework, it may prove more difficult to predict environmental outcomes, both in terms of ensuring that individual efforts add up to what is scientifically required and that actors meet their pledges within the proposed timeline. In particular, if science is no longer the central point of reference for objectives and timelines, it can become difficult to identify a different benchmark for the success of the regime.

17. For recent examples, see Abbot (2012); Aldy and Stavins (2007); Aldy and Stavins (2010); Barrett and Toman (2010); Bodansky and Diringer (2007); Bosetti et al. (2008); Evans and Steven (2009); Hare et al. (2010); Keohane and Victor (2010); Okereke et al. (2009); Olmstead and Stavins (2009); Pizer (2007); Rayner (2010); Stavins (2009); Stavins (2010); Tangen (2010); WBGU (2009); WBGU (2010). An overview of earlier proposals is provided by Aldy et al. (2003); Bodansky (2004).

Absent from an *ex ante* allocation of collective efforts, moreover, the "bottom-up" approach may also contribute to higher levels of free riding and fail to capture equity concerns among participants (Dubash et al., 2010: 595). Indeed, by circumventing the established decision making processes of international law, the outcome of "bottom-up" regime building may be thought of as less legitimate than universally negotiated commitments, especially where small groups of powerful states decide to resolve a global challenge at the exclusion of large parts of the international community (Bodansky et al., 2004; Reinstein, 2004). And finally, existence of concurrent regimes in an increasingly fragmented policy system not only requires better interplay management (Biermann, 2010: 286) but also leads to potential forum-shifting in which actors move a regulatory agenda from one forum to another, abandon a forum, or pursue the same agenda in more than one forum (Braithwaite and Drahos, 2000: 29).

Because of its relative simplicity and straightforward application, the distinction between "top-down" and "bottom-up" approaches to international climate cooperation has been widely used as a framework of analysis to structure and explain recent trends in the climate negotiations.[18] Without disputing its conceptual utility, however, it stands to reason that the complexities of sovereign engagement on climate change cannot be fully captured by a binary dichotomy. In actual practice, climate cooperation clearly manifests elements of both approaches, which arguably complement each other—for instance when international targets incentivize domestic action, or varying progress at the national level results in efforts to achieve international coordination—and are unlikely to see one paradigm completely displace the other.

Acknowledging the discussion on "top-down" and "bottom-up" climate governance is important to understand much of the current literature on alternative regime options, but it is too narrow a framework for useful comparison of different regime elements and characteristics. In an attempt to bridge two largely separate debates, the following section draws on an existent body of work regarding the evaluation of policy instruments for domestic climate policy and rules and institutions for international environmental governance, leveraging criteria developed therein for application to the context of international climate cooperation.

Evaluating Frameworks of International Climate Cooperation

Evaluating Climate Policies and Measures: The Domestic Dimension

Decision makers seeking to address the causes and effects of climate change can take recourse to a portfolio of policy instruments, including pricing controls and rationing,[19] performance standards, subsidies, agreements, and informational instruments (IPCC, 2007: 750; OECD, 2009: 18–22).[20] In practice, these instruments are applied alone or in varying combinations to different sectors, such as electricity generation, transport, buildings, and industry (Krupnick, 2010: 8–9).[21] By diverting resources and capital away from the production of conventional goods and services, and often into costly abatement measures, these instruments can have a detrimental effect on economic growth in the short term. Over the medium and longer term, the various co-benefits of mitigation action, such as energy savings, reduced health impacts, or improved energy security, suggest that a carefully designed strategy to lower greenhouse gas emissions will generate greater benefits than

18. See, for instance, Barrett et al. (2010); Bodansky (2004); Reinstein (2004); Victor et al. (2005); retaining the notion of two extremes along a continuum, but arguing for a "middle ground" of parallel efforts integrated in a multi-track framework or regime complexes: Bodansky et al. (2007); Keohane and Victor (2010); Pew (2005).

19. Pricing models date back to Pigou (1920), and notably include emissions charges and taxes set to cover the marginal damage caused by polluting activities, thereby internalizing their costs; rationing, in turn, is based on work by Dales (1968): 92–100 and Montgomery (1972): 395, both building on Coase (1960), and generally requires the creation of a market for tradable emission allowances, where each allowance confers the right to discharge a specified quantity of pollutants for a limited duration of time; for further details, see Tietenberg (2006). For a discussion of relative merits, see Weitzman (1974).

20. This is a very broad categorization of policy instruments, and further differentiation is possible, see OTA (1995): 81–89.

21. In a majority of sectors, greenhouse gas mitigation will be achieved by improving the efficiency with which energy is used or by reducing its carbon intensity, see OECD (2009): 11, but in agriculture, forestry, and certain chemical and industrial processes where emissions are not related to energy use, different approaches—such as stabilization or expansion of carbon sinks—are applied.

costs,[22] but current political and economic decision making cycles are noted for being myopic and providing little incentive for anticipatory governance or foresight (Fuerth, 2004). Additionally, while the social cost of action is expected to be lower than the impacts of unabated climate change, it will nonetheless rise over time as readily available abatement options are exhausted and more costly solutions need to be explored (Stern, 2006: 63, 191). In the context of climate change, therefore, both the rationale of policy instruments and the manner in which they are designed have been sensitive to economic concerns from a number of important stakeholders, prompting widespread adoption of flexible or suasive incentives alongside more coercive regulatory prescriptions.[23]

With this broad range of available instruments comes a need for reliable criteria to guide and justify selection processes between contending approaches to climate governance. While it is widely agreed that no single model can serve as a panacea for all regulatory purposes (Goulder et al., 2008: 2), a number of criteria have gradually evolved in various academic disciplines to evaluate individual instruments and their combination in a coordinated portfolio. At a sufficient level of abstraction, the following criteria are typically proposed:

- *Environmental effectiveness*: How well does a policy instrument meet its intended environmental objective? How certain is its level of environmental impact?
- *Cost effectiveness*: Can the policy achieve its objectives at a lower cost than other policies? Does it create revenue streams that can be reinvested?
- *Distributional considerations*: How does the policy impact consumers and producers? Can it be considered fair and equitable?
- *Institutional feasibility*: Is the policy instrument likely to be viewed as legitimate, gain political acceptance, be adopted and ultimately implemented? (IPCC, 2007: 751).

While these criteria are widely advocated, albeit with slight variations,[24] it bears noting that processes of instrument choice are often complicated by the fact that individual criteria tend to compete with each other, rendering tradeoffs inevitable and any selection largely dependent on specific circumstances (Goulder et al., 2008: 2), contested assumptions, and contingent preferences. Additionally, climate governance tends to address several market failures and seek a variety of outcomes, thus necessitating the use of more than one instrument (Tinbergen, 1952). Yet with the simultaneous operation of various instruments comes a risk of adverse interactions or even redundancies (OECD, 2009: 27). Some instruments will pursue more than one objective (Knudson, 2009: 308), and the extreme uncertainties underlying causes and impacts of climate change as well as policy outcomes further complicate the evaluation of relevant instruments (Weitzman, 2009: 8–10). And yet, despite being prone to epistemic limitations and normative contingency, evaluation criteria can still offer a heuristic tool by which the defining characteristics of different policy instruments are identified and rendered mutually comparable.

As the next section illustrates, similar complexities are also faced when seeking to apply evaluation criteria to international regimes; many of the considerations guiding the debate on domestic instrument choice can, however, be applied to the international plane (Stewart, 2007: 159).

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22. Especially when taking into consideration the expected costs of climate change impacts, such as extreme weather events, flooding, crop losses, vector-borne diseases, and biodiversity loss, see e.g., CBO (2008): 11.

23. Limiting the economic burden requires equalization of marginal abatement costs across the economy and for each source, something price- and quantity-based instruments are said to achieve better than rigid technology standards (Baumol and Oates, 1988: 177; Keohane et al., 1998: 313); as a result, conventional regulation, criticized for belonging to an "extraordinarily crude, costly, litigious, and counterproductive system of technology-based environmental controls" (Ackerman and Stewart, 1985: 1333), has been increasingly joined or supplanted by market incentives, all with an aim to "improve the command system through better balancing of regulatory costs and benefits, improved risk analysis and management, and greater flexibility" (Stewart, 2001: 21).

24. Similar criteria are e.g., reported in the broader academic literature, see, for instance, Baumol and Oates (1988): 57–78; Goulder et al. (2008): 3–23; Harrington et al. (2004): 5; OTA (1995): 143–147; or Sterner (2003): 133–134; of course, actual practice has often "diverged strikingly from the recommendations of normative economic theory," see Keohane et al. (1998): 313, and will be strongly influenced by local traditions, cultures, institutions, and infrastructures, with institutional capacity especially constraining viable choices in developing countries, see Bell (2003): 22.

Evaluating Climate Cooperation: The International Dimension

Both the nature of climate governance and its objectives differ fundamentally between the national and international level. Unlike domestic climate policy, which can rely on public institutions endowed with authority to enforce obligations and settle disputes, international cooperation presupposes that sovereign states assent voluntarily to any obligations they assume and subsequently implement these (Wiener, 1999: 683; Werksman, 2010: 673). Climate change is a complex and long-term challenge that can only be solved through collective action (Underdal, 2010: 1), and any abatement efforts—or absence thereof—will have repercussions on the international community in its entirety, as well as on the position of domestic constituents in the states undertaking such efforts (Hare et al., 2010: 602). For instance, while all states will benefit from the greenhouse gas controls adopted by any one state, the acting state will enjoy only a small share of the benefits of its own efforts (Ostrom, 2009: 7–8, differentiating on Hardin, 1968, and Olson, 1965). Given this inherent disposition to encourage free-riding and generate spillover effects, countries have a strong incentive to limit emissions only "so long as it were assured that all others would reduce their emissions as well" (Barrett et al., 2010: 4).

Conversely, domestic entities in active states will face a rising regulatory burden, potentially placing them at a disadvantage *vis-à-vis* competitors in countries without comparable environmental constraints. In a global economy with increasingly free movement of trade and investment, such differences in the ambition of national abatement efforts can have far-reaching consequences, both in economic and environmental terms. Accordingly, international climate cooperation needs to achieve a balance between substantive ambition, scope of participation, and level of compliance. Any set of criteria used to evaluate different models of global climate cooperation will need to reflect this underlying reality of international environmental governance (Stewart, 2007: 161).

Consequently, the categories guiding an assessment and classification of contending international governance architectures can only be informed by, but not identical to, the criteria set out in the preceding section. Unlike the domestic level, where the research community and scientific bodies have formulated a widely recognized canon of evaluation criteria, no benchmarks of comparable authority have yet been defined for the international debate. Instead, different approaches to the study of international relations and global governance have resulted in very diverse assessment metrics, each premised on a particular outlook and understanding of cooperation between states and the social, political, or economic priorities it is meant to address. In the field of international environmental governance, a rich and insightful literature has emerged on the assessment of regimes, treaties, and institutions, some of which has clearly informed our current understanding of international climate cooperation. Some major strands of this research are briefly highlighted in the following subsection.

EVALUATING FRAMEWORKS OF INTERNATIONAL ENVIRONMENTAL GOVERNANCE

Past decades have seen an astounding proliferation of international arrangements in the area of the environment. A widespread perception that these have proven only marginally successful sparked growing interest, both institutional and academic, in the conditions and requirements of improved environmental governance. Over time, this shift in attention from the design of new international environmental arrangements to their evaluation and improvement has elicited a number of individual and collaborative research efforts across academic disciplines, producing a wealth of output and generating intense debate. In effect, research on the role and consequences of environmental regimes, treaties, and institutions became such a dominant part of the study of international relations at one point that it compelled a scholar to speak of a "veritable growth industry" and a "driving force" in his field (Zürn, 1998: 649). Much of the resulting literature has focused on specific dimensions of regime performance, with the greatest weight being afforded to

questions of effectiveness, followed by research on economic impacts, fairness, and equity (Mitchell, 2008).

But even within these narrow categories, terms and definitions have varied greatly due to "elusive" (Keohane, 1996: 8; Young et al., 1999: 3) concepts involving "daunting evaluative and analytical problems" (Bernauer, 1995: 352) that have given rise to much "disagreement, both in method and approach and in substantive views" (Kingsbury, 1997: 50). Significant variations in the focus of relevant studies, as well as the distinct intellectual backgrounds and orientation of their authors, have resulted in very different approaches to the measurement of performance in terms of outputs, outcomes, and impacts (Underdal, 2008). Research on the effectiveness of international environmental governance, for instance, was initially prompted by a shared concern about the ability of cooperative arrangements to influence state behavior, and hence focused on issues of regime design and improved compliance management. But definitions of what exactly constitutes "effective" governance differed widely in earlier research, with some authors merely seeking behavioral change or observable political effects,[25] while others set the threshold higher by looking for an improvement in—or even resolution of—the situation that necessitated cooperation in the first place.[26] Although later research has become more critical in terms of applied methods and concepts (Mitchell, 2008; Underdal, 2008), even a recent shift to more empirical[27] and quantitative[28] approaches has failed to altogether eliminate some of the more persistent epistemic challenges in the study of regime effectiveness, including identification of the purpose of cooperation and of causal connections between governance systems and subsequent behavioral or physical change (Dai, 2008:158).

While the conceptual limitations of this line of research are thus readily apparent,[29] the work to date reflects a sophisticated intellectual effort to determine whether international environmental cooperation plays a role in shaping collective action and social practices. Progress has been made, in particular, when it comes to distinguishing normative and utilitarian motives for state behavior (Young, 2002) and extending the perception of environmental compliance beyond binary treaty observance to a more managerial process focused on clarity, capacity, and priority (Chayes et al., 1995; Brunnée et al., 2002; critically Koskenniemi, 1992: 147), in which soft incentives and facilitation play as much a role as traditional legal coercion (Karlsson-Vinkhuyzen et al., 2009; Skjaerseth et al., 2006). More recently, scholars have responded to the rapid growth in environmental regimes by focusing on regime fragmentation and overlap, discussing options to manage conflicts and leverage synergies between multiple levels of governance and concurrent governance systems (Biermann et al., 2009; Keohane and Victor, 2010; Selin and VanDeveer, 2009).

Overall, there can be little doubt that our comprehension of international environmental cooperation has been greatly advanced, from the earliest stages of diplomatic negotiation to the final application and enforcement of individual arrangements. Nonetheless, studies of regime performance have so far failed to yield a set of clear and robust generalizations about the conditions for successful environmental governance (Young, 2010: 7). In particular, aspects other than compliance and effectiveness, such as economic impacts, fairness, and legitimacy, have received less systematic

25. Greene (1996): 200; Haas et al. (1993): 7 ("observable political effects"); Raustiala et al. (1998): 1; Young (1996): 10 ("behavioural effectiveness").

26. See, e.g. Carroll (1988): 276 ("when measured against getting the problem solved, and that should be the only real measure"); Endres et al. (2000): 73 ("[u]nter der Wirksamkeit eines Vertrages verstehen wir, daß sein Abschluß . . . zu einer Wohlfahrtssteigerung . . . führt"); Helm et al. (2000): 635 ("perfect regime"); Keohane (1996): 14 ("[t]he proof of effectiveness is to be seen in the improvement of the targeted aspect of the natural environment"); Levy (1996): 395; Oberthür (1997): 47 ("die Verhaltenswirkungen, die im Sinne einer Problemlösung positiv zu bewerten sind"); Raustiala et al. (1998): 1 (ability to "help solve environmental problems"); Susskind (1994): 12 ("tangible environmental improvements"); Young (1994): 3 ("[a]n effective governance system is one that channels behavior in such a way as to eliminate or substantially to ameliorate the problem that led to its creation"); Young (1996): 8–9 ("problem solving" and "goal attainment"); Young et al. (1999): 5.

27. See, e.g., Miles et al. (2002).

28. See, e.g., Breitmeier et al. (2006); Hovi et al. (2003); Mitchell et al. (2006).

29. As Bernauer (1995): 356 has phrased it, "[t]he authors . . . refer almost interchangeably to institutional effect, impact, effectiveness, institutional roles or functions, success or failure, and compliance, as well as to actor behaviour and the state of the natural environment."

consideration in the absence of large, integrated research networks (Mitchell, 2008: 93).[30] Future work is likely to address such remaining gaps while further improving the clarity and transparency of analysis. Standardized definitions of key concepts, more rigorous comparison of findings across projects and disciplines, and use of advanced methods such as statistical analysis, simulations, and integrated case studies will help aggregate cumulative knowledge about the dynamics that affect regime formation and implementation (Young, 2010: 21–24). In the meantime, however, the research agenda remains heterogeneous, underscoring the earlier assertion that no single approach can capture the diverse ways of looking at international environmental cooperation,[31] calling instead for a case by case determination of suitable evaluation criteria.

SURVEY OF EXISTING LITERATURE ON CLIMATE COOPERATION

Where studies have sought to evaluate different options for international climate governance, parallels to the substance and rationale of the foregoing criteria are readily apparent. To the extent that such analysis has gone beyond the simple dichotomy of "top-down" and "bottom-up" categories, central categories—such as the effectiveness in addressing climate change—recur throughout pertinent literature. Additional criteria are assembled in a more eclectic fashion, with research guided less by systematic considerations and variedly focusing on distributional and economic impacts, regime coherence, institutional capacity, and other considerations held to have an impact on climate governance. In the absence of large-scale coordinated research work, most benchmarks applied to the study of international climate cooperation reflect a more pragmatic and spontaneous approach than comparable research on domestic climate policies and measures, or indeed on international environmental governance. Although offering unquestionable flexibility, this approach to the discussion of alternative governance frameworks again suffers from drawbacks in terms of comparability and systematic accumulation of knowledge. Drawing on brief summaries of relevant literature, the following subsection will seek to identify guiding criteria for the evaluation of international governance options for climate change mitigation and adaptation. Only five research efforts have sought to define such criteria; interestingly, four out of five have been conducted at academic institutions or think tanks in the U.S., and the fifth is directly connected to a project in the U.S.

Thirteen Plus One: A Comparison of Global Climate Policy Architectures (Aldy, Barrett, and Stavins, 2003)

In an early article reviewing the Kyoto Protocol—the fate of which was still unclear at the time the article was written—as well as thirteen alternative policy architectures for international climate cooperation, the authors base their evaluation on six "key performance criteria" (Aldy et al., 2003: 374):

- *Environmental outcome*:[32] likely magnitude of environmental outcomes, taking into account temporal delays, leakage effects, and the challenges involved in measuring highly uncertain variables against a counterfactual baseline;
- *Dynamic efficiency*: achievement of maximum aggregate net benefits, covering actions, impacts, benefits, and costs that occur over very long time horizons, and accounting for uncertainties due to the intertemporal nature of the problem;
- *Cost-effectiveness*: least costly means of achieving a given target or goal, regardless of

30. By contrast, where comprehensive research has been undertaken the criteria applied are so far-reaching as to render their subsequent application more difficult outside of the specific project context, see the detailed set of thirty criteria applied by Jacobson et al. (1998): 536, covering the nature of the activity being regulated, the way the regime is designed, the international environment, and the characteristics of the countries that are subject to regulation.

31. See, however, efforts such as the "Oslo-Potsdam Solution" to performance measurement through performance scores, Hovi et al. (2003).

32. The authors point out that, from an economic perspective, measuring dynamic efficiency would obviate this criterion; yet it is nonetheless included, as it better reflects the priorities of some participants in the debate.

whether it is efficient in terms of the net benefits achieved through this cost;
- *Equity*: distribution of the benefits and costs of policy action, both cross-sectionally and over time, necessitating the identification of international, intranational, and intergenerational distribution effects guided by a subset of criteria including responsibility for the accumulation of greenhouse gases in the atmosphere, ability to pay for response measures, accrual of benefits from policy action, and the trade-off between present distributional and intergenerational equity;
- *Flexibility*: ability to adapt to new information through sequential decision making that facilitates the modification and adaptation of policies as new information reduces uncertainties; and
- *Participation and compliance*: ability to deter free riding behavior through either nonparticipation or noncompliance, taking into account trade-offs between "narrow-but-deep" and "broad-but-shallow" cooperation.

In the remainder of the article, the authors apply the foregoing six criteria to the Kyoto Protocol and thirteen alternative frameworks for climate cooperation proposed in academic literature. None of the assessed frameworks score high on all criteria, leading the authors to identify certain inherent trade-offs in their conclusions (Aldy et al., 2003: 394).

International Climate Efforts beyond 2012: A Survey of Approaches (Bodansky, 2004)
For this policy paper prepared on behalf of the Pew Center on Global Climate Change, the author proposes general criteria that could be used to evaluate alternative frameworks for international climate cooperation beyond 2012. Unlike the other studies mentioned here, the author distinguishes "policy" and "political" criteria. Policy criteria relate to the intrinsic characteristics of the proposed framework, and include (Bodansky, 2004: 5):

- *Environmental Effectiveness*: primarily relates to the stringency of the surveyed approach, but also includes corollary aspects such as controlling leakage, stimulating long-term technological change, and ensuring adequate enforcement;
- *Cost-Effectiveness*: ability to reduce emissions at lower cost than comparable proposals;
- *Equity*: perception that a proposal is sufficiently equitable or, at the least, not demonstrably unfair;
- *Dynamic Flexibility*: commitments can be scaled up or down, or otherwise modified, to allow easier reassessment and revision in light of new scientific and economic information; and
- *Complementarity*: facilitates linkages among multiple regimes or approaches.

By contrast, political criteria relate to whether a proposed cooperation framework fits with the political and institutional context, determining the ability to negotiate and implement future climate efforts (Bodansky, 2004: 5–6):

- *Continuity*: ability to build on, or remain within, the UNFCCC and Kyoto Protocol architecture;
- *Economic Predictability*: ability to limit unpredictable cost variables such as economic and population growth, and the rate of technological change;
- *Compatibility with Development Goals*: ability to help advance, rather than compete with, development priorities such as economic growth and poverty reduction; and
- *Implementability*: compatibility with the capabilities and limitations of the institutions on which implementation and compliance will depend, including ease of monitoring and predictability of compliance.

As the author notes, some of the foregoing assessment criteria may be complementary, such as cost-effectiveness and environmental effectiveness, while others may give rise to

tensions, for instance, certainty of mitigation cost and certainty of environmental benefit (Bodansky, 2004: 6).

Modeling Economic Impacts of Alternative International Climate Policy Architectures (Bosetti, Carraro, Sgobbi, and Tavoni, 2008)

In this discussion paper, a group of Italian authors have sought to provide a quantitative assessment and comparison of competing architectures for climate cooperation beyond 2012. Drawing on the work conducted in the Harvard Project on International Climate Agreements, they assess eight possible successors to the Kyoto Protocol based on four criteria (Bosetti et al., 2008: 11–19):

- *Relative Environmental Effectiveness*: degree to which the problems associated with climatic change are addressed, measured as temperature change above pre-industrial levels in 2010;
- *Economic Efficiency*: cost implications of the proposals, measured as changes in Gross World Product (GWP) under each proposal with respect to the status quo over the next century, discounted at a 5 percent discount rate;
- *Distributional Implications*: distribution of the costs and benefits of climate change and climate change policy, assessed by an index that represents the concentration of income between regions of the world, and shows inequality in income distribution at the end of the century; and
- *Potential Enforceability*: degree to which a proposal limits incentives to free ride and is enforceable, measured by changes in global and regional welfare with respect to the status quo.

Based on these indicators and a set of modeling tools, the authors arrive at quantitative scores for each of the foregoing criteria. As part of their conclusions, they submit a number of general recommendations, including the need to strengthen the ambition of all surveyed proposals and the expedience of incorporating gases other than CO_2 as well as the forestry sector. Likewise, they affirm trade-offs between the different criteria, and find that only cooperation on technological research and development will be sufficiently attractive in economic terms to be global and self-enforcing, yet virtually ineffective in addressing climate change (Bosetti et al., 2008: 21).

The Regime Complex for Climate Change (Keohane and Victor, 2010)

With this more recent paper drafted for the Harvard Project on International Climate Agreements, the authors draw on their earlier work on regime complexes—defined as loosely coupled sets of specific regimes and hence closer to the concept of a governance "architecture"—and propose evaluating these on the basis of six criteria, with each running from dysfunctional to functional (Keohane and Victor, 2010: 19–20). The criteria are:

- *Effectiveness*: appropriateness of and level of compliance with rules, and ability to thereby create net benefits for members;
- *Coherence*: degree to which the various regimes that form part of the broader climate change regime complex are compatible and mutually reinforcing, as opposed to incompatible and mutually harmful;
- *Accountability*: degree to which relevant audiences, including states, nongovernmental organizations and the public, have the right to hold elements of the regime complex to a set of standards, to judge whether relevant actors have fulfilled their responsibilities in light of these standards, and to impose sanctions if they determine that these responsibilities have not been met;
- *Determinacy*: degree to which rules have a readily ascertainable normative content, reducing uncertainty and thereby improving long-term planning and investment;

- *Sustainability*: degree to which elemental regimes represent a coherent equilibrium and are hence politically more stable and resilient to shocks; and
- *Epistemic quality*: consistency between rules and scientific knowledge, and capacity to revise both rules and terms of accountability of decision makers accordingly.

Applying the foregoing criteria to the existing climate change regime complex centered on the UNFCCC and the Kyoto Protocol, the authors conclude that none of the current institutions obtain high rankings on any of the six criteria. In addition, the authors point out that these criteria are particularly useful when applied to a complex of loosely coupled elements rather than a single, integrated scheme.

Designing an International Climate Regime: Moving the UNFCCC Forward (Moncel, Joffe, McCall, and Levin, 2011)

In a joint effort to examine proposals "that are relevant to the design of an institutional architecture," the World Resources Institute (WRI) and the United Nations Environment Program (UNEP) recently conducted a project to survey academic literature as well as proposals by nongovernmental organizations (NGOs) and governments based on a set of criteria that "are necessary for any future regime to be politically, economically, socially, legally, and environmentally sustainable." Specifically, the project based its assessment on the following criteria:

- *Adequacy*: ability of the regime to effectively elicit and deliver actions by countries in a manner commensurate with the best available scientific information, both with a view to the time frame and the range of measures required;
- *Equity*: perceived legitimacy of an agreement by all parties, encompassing both equity of process and equity of substance; and
- *Implementation*: ability of governments to enforce within their jurisdiction rules agreed nationally or internationally, including the capacity to put rules and regulations into force, to monitor and track adherence to the rules, and to enforce compliance or remedy noncompliance where it arises.

According to the project leaders, the foregoing criteria are "fundamental to ensuring legitimacy and effectiveness of any agreed outcome." While they acknowledge other criteria could be selected, they affirm their belief that these criteria capture the "essence of a long-term, enduring, and sustainable climate regime" and aim to provide more complete definitions and context behind each definition (Moncel et al., 2011).

INTERIM CONCLUSIONS

As the foregoing subsections have shown, efforts to evaluate alternative frameworks for international environmental governance and climate cooperation share a number of characteristics. Unsurprisingly, both areas of research are guided by the same overarching concern about the ability of governance frameworks to achieve what is typically their primary *raison d'être*, the alleviation of an environmental challenge. In the literature on alternative climate policy frameworks, the corresponding criteria have different designations, ranging from environmental outcome and environmental effectiveness to level of ambition, but what they have in common is an underlying preoccupation with how cooperation addresses the problem of climate change. In the broader work on the performance of international environmental regimes and institutions, this focus on effectiveness has seen a greater level of differentiation and methodological sophistication, with more recent studies distinguishing the actual achievement of environmental outcomes from the preceding ability to elicit compliance and behavioral change. Of the five surveys of climate policy architectures, four single out this latter aspect to formulate a separate criterion related to implementation, which comprises

aspects of compliance and enforcement, but also of administrative and financial capacity. Arguably, this reflects the greater complexity and scale of climate change and of appropriate response measures, at least relative to many other environmental challenges.

In domestic environmental policy, the economic impact of specific instruments features prominently in the debate on their respective merits and shortcomings. For international institutions and regimes, it becomes significantly more difficult to estimate the economic cost of achieving an agreed objective, let alone to measure costs against benefits in an issue area where both are highly uncertain and spread out over an extended period of time, necessitating application of inevitably controversial discount rates. As a result, few studies of the performance of international governance frameworks incorporate an economic criterion, and to the extent they do, they largely limit themselves to broad indicators such as the use of market mechanisms or other flexible approaches. Still, three of the studies proposing criteria for the assessment of climate governance frameworks explicitly mention cost-effectiveness or economic efficiency, and two go even further to calculate aggregate welfare effects of alternative models of cooperation. A fourth study incorporates economic considerations, but rather in terms of the predictability of costs rather than a genuine cost benefit analysis.

Given the changing nature of scientific knowledge about climate change but also the potential for technological innovation and other unforeseen developments, a majority of studies also include aspects of flexibility or adaptability, again resonating with similar work in the broader study of international environmental governance. Likewise, equity concerns—variously defined as the distribution of costs and benefits, fairness, and legitimacy—are mentioned in most studies, reflecting the disproportionate importance these issues have held in the international climate discussion. Of the proposed sets of criteria, two also list regime coherence or complementarity, acknowledging the existence of more than one concurrent forum of cooperation. A related consideration is continuity, that is, the degree to which a cooperation framework can build on existing institutional and regulatory architectures. Surprisingly, only one of the surveyed studies lists participation, that is, the geographic scope and coverage of a climate governance framework. Likewise, only one study each lists the criteria of accountability, development compatibility, determinacy, and sustainability. Finally, one study lists epistemic quality, that is, the consistency of environmental objectives with scientific insights and recommendations, but this may be subsumed under the broader categories of environmental outcome and flexibility. All criteria proposed in the studies surveyed in the foregoing section are listed in Table 1 below.

An Assessment Matrix for International Climate Cooperation

Existing surveys of alternative approaches to international climate governance have already devoted significant intellectual effort to defining generally applicable criteria for the evaluation of cooperative frameworks. What is more, they have been, to a greater or lesser extent, able to build on the cumulative insights offered by previous research on the assessment of domestic environmental policy and international environmental governance. Still, the criteria proposed to date in relevant literature are fairly heterogeneous. Only one criterion—environmental effectiveness—is common to all proposals, and even that is characterized by variations in the conceptual definition and scope. Other criteria, such as economic implications and considerations of equity, feature in a majority of studies, but again, their material content varies substantially. Comparisons across surveys are difficult, if not impossible.

What this section attempts to formulate is an assessment matrix comprised of harmonized criteria drawn largely from the existing literature but geared toward a pragmatic approach that avoids speculative or highly uncertain concepts and facilitates application without the need for sophisticated models or datasets. Additionally, it seeks to accommodate the trends apparent in recent international climate cooperation described in the second section, notably the emergence of multiple regimes simultaneously addressing the challenge of global climate

change, and the shift toward more informal, decentralized approaches to climate governance. In this new reality of horizontally fragmented multilevel governance, where systemic coherence becomes as much a challenge as balancing narratives of equity with broader (and deeper) participation in global climate efforts, the following assessment matrix can help compare alternative governance options currently proposed by governments, the research community, and other stakeholders.

Table 1: Criteria for the Evaluation of International Climate Cooperation

Proposal Criterion	Aldy et al. (2003)	Bodansky (2004)	Bosetti et al. (2008)	Keohane et al. (2010)	Moncel et al. (2011)
Environmental Effectiveness					
Environmental Outcome	X	X	X	X	X
Implementation Control	X	X	X		X
Geographic Scope	X				
Economic Implications					
Cost Effectiveness	X	X	X		
Dynamic Efficiency	X		X	(X)[33]	
Economic Predictability		X			
Impact on Development		X			
Fairness and Legitimacy					
Equity	X		X		X
Accountability				X	
Sustainability				X	
Adaptability					
Flexibility	X	X		(X)[34]	
Epistemic Quality				X	
Structural Aspects					
Regime Coherence		X		X	
Regime Continuity		X			
Determinacy				X	

Source: Author, based on Aldy et al. (2003), Bodansky (2004), Keohane and Victor (2010), and Moncel et al. (2011).

Defining a Common Set of Criteria

Drawing on the existing body of literature and also accounting for recent trends in international climate cooperation, the proposed matrix includes the criteria listed in the following subsections. It bears restating that the selection below neither seeks perfect analytical stringency, nor claims

33. Effectiveness as a criterion is defined as including the ability to "create net benefits for members," a consideration that factors into dynamic efficiency.

34. Epistemic quality as a criterion also includes an element of flexibility in that it integrates the "capacity to revise . . . rules" in accordance with scientific knowledge.

to be exhaustive in scope; rather, it hopes to provide a practical framework for the evaluation and comparison of alternative models of climate governance, albeit incorporating the current state of research on the topic, and hence providing some continuity vis-à-vis relevant past efforts. None of these criteria is inherently more important than its counterparts; instead, the importance of each criterion will largely depend on the context and priorities of those applying them, with inevitable trade-offs and a need to balance or give weight to different preferences and expectations.

LEVEL OF AMBITION

As in the domestic context, international climate governance is not an end upon itself. A central measure of any governance framework should be its ability to address the challenges that gave rise to it. In the case of climate cooperation, the primary benchmark can be defined as the suitability of a regime or institution to contribute to the mitigation of climate change and, given the increasingly evident inevitability of some measure of atmospheric warming, the adaptation to its impacts. Unlike most previous studies, however, including the substantial body of research into the performance of international environmental regimes and institutions, it is submitted here that any attempt to capture the expected impacts of a climate cooperation architecture *ex ante*, that is, before actual implementation, is by necessity highly speculative or dependent on the availability of extremely sophisticated modeling capacities and data. As past research has amply shown, even an *ex post* evaluation still faces rigorous challenges in terms of establishing causality and assigning outcomes in an issue area as complex as climate change governance. What is more, identifying the desired or intended environmental outcome is frequently difficult given other competing aspirations, explicit or tacit, of the respective governance framework (Mitchell, 2008: 94).

For the foregoing reasons, the criterion proposed here is "level of ambition," defined as the ambition of objectives set out under a cooperative framework vis-à-vis accepted mitigation and adaptation imperatives. It is an essentially normative criterion and avoids the discussion about whether changes in state behavior are simply reflections of underlying power structures in international society or whether regimes and institutions exercise significant influence in their own right (Mearsheimer, 1994). When it comes to climate change mitigation, for instance, the level of ambition can be assessed based on the declared objectives of cooperation. As an external benchmark, the evaluation could draw on widely agreed goals, such as the decision recently endorsed by the international community in Cancun to hold the increase in global average temperature below 2°C above preindustrial levels.[35] Rather than relying on a static benchmark, however, it may be preferable to measure the ambition of objectives against evolving scientific recommendations, thereby incorporating an element of flexibility and improving the epistemic merits of this criterion.

Ultimately, "level of ambition" is thus not so much a criterion aimed at predicting environmental or behavioral outcomes with mathematical precision, but rather a "first approximation surrogate for effectiveness" (Chayes et al., 1993: 176). Defined this way, it comes to encompass the criteria of environmental outcome and epistemic quality listed in Table 1 above.

COMPLIANCE FACILITATION AND CONTROL

Because the achievement of an agreed objective is intrinsically linked to the design of the accompanying cooperation framework, the evaluation will also need to factor in aspects such as the clarity and determinacy of commitments, the robustness of incentives for compliance, the mechanisms—whether facilitative or coercive—to address noncompliance, as well as the provisions set out to ensure sufficient transparency of efforts undertaken by participants. It

35. See Decision 1/CP.16, FCCC/CP/2010/7/Add.1, 15 March 2011 ("Cancun Agreements"), para. 4. In the context of adaptation, no similar benchmarks have been defined, except perhaps the decision to provide certain financial transfers through mechanisms such as the Adaptation Fund, see also OECD (2008): 27.

is also here where the legal nature of commitments and procedures—binding or voluntary—can be subsumed, without prejudice to whether legally binding commitments are more likely to promote compliance or deter their adoption in the first place. And while the domestic capacities of regime participants are not initially a consequence of the regime design, provisions to address capacity constraints and promote capacity building may count toward the overall ambition of a regime or institution. Similarly, experience suggests that procedures to ensure accountability and stakeholder participation are likely to help achievement of the objectives of cooperation and should be taken into consideration when assessing the level of ambition. Under this definition, "compliance facilitation and control" incorporates the criteria of implementation control, accountability, and determinacy listed in Table 1 above.

INSTITUTIONAL CAPACITY

Ambitious objectives and procedures to ensure their achievement are necessary, but not sufficient, criteria for the performance of a governance framework. Increasingly, climate cooperation involves sophisticated responses and mechanisms that call for some form of institutional capacity, be it to monitor implementation by participants, perform procedural functions, or facilitate the operation of regime elements. For instance, the UNFCCC and the Kyoto Protocol have seen the creation of an infrastructure with proprietary resources and a staff of several hundred experts,[36] bringing technical knowledge, an institutional memory, and professional routines to the climate negotiations and specific regime elements, such as the carbon market established by the flexibility mechanisms. Another aspect that can be considered in this context is the relevance of climate change to the mandate of an institutional architecture: Would climate change be its central focus or merely one of many competing issues to which institutional and political resources are allocated? To some extent, this criterion encompasses aspects of regime continuity and implementation proposed by the studies listed in Table 1 previously.

PARTICIPATION AND INCLUSIVENESS

Given the projected emission trends around the world, long-term stabilization of greenhouse gas concentrations will not be achieved or will only be achieved at an unacceptably high level of emissions or cost, unless there is sufficiently broad participation in cooperative efforts to address climate change (OECD, 2009: 23–24). In particular, all major emitters—including most developed and many emerging economies—would need to be included in a future climate architecture to effectively mitigate global greenhouse gas emissions. Moreover, if only some countries or regions participate in the cooperative framework, certain sectors of the economy—such as energy-intensive industries—in those countries or regions would be at a disadvantage relative to their competitors in excluded countries, resulting in political pressures and an increased risk of emissions leakage, where emission reduction in participating countries may be offset by higher emissions in others. Past experience suggests there is a tradeoff between broad participation and level of ambition; yet because participation in international environmental regimes is voluntary, there is a tendency to create arrangements that are shallow when measured by substance so as to make them palatable to all the relevant actors (Young, 2010: 16). This criterion takes up the notion of geographic scope included in Table 1 above.

SYSTEMIC COHERENCE

With the growing number of distinct regimes active in the area of climate change, concerns about potential interactions, such as an overlap of activities and mandates, are acquiring increased weight. As recent studies have observed, international cooperation on climate

36. According to the UNFCCC secretariat, its staff of "around 500 international civil servants works towards the UNFCCC's goals. . . . Among other things, the staff supports climate change negotiations, organizes meetings and analyses and reviews climate change information and data reported by parties," see UNFCCC, 2010.

change can range along a continuum in which one extreme is a comprehensive and integrated governance system for the entire issue area and the other extreme is total fragmentation (Keohane et al., 2010). Conflicts and tensions between different institutional arrangements can potentially compromise the effectiveness of cooperation. At the same time, properly integrated regimes will ideally complement each other and leverage synergies (van Asselt, 2011). This underscores the need to ensure some level of coordination between institutions, for instance by adopting mandates that specify clear and separate responsibilities, or by including conflict clauses and procedures that address potential overlaps.

But systemic coherence is not purely an issue at the level of institutions active in the area of climate policy: Regimes may also interact with each other at a material or conceptual level, be it horizontally between regimes devoted to different issue areas such as climate change and international trade or vertically at different levels of implementation. On the latter, because climate policies and measures ultimately have to be carried out and enforced at the domestic level, successful cooperation frameworks need to take into account potential interactions with local or regional rules and institutions. Again, however, a trade-off may exist between high levels of integration and more loosely organized, flexible cooperation. Typically, integrated arrangements will be more cumbersome and time-consuming to establish and more apt to entail compromises that dilute the content of their substantive provisions (Young, 2010: 12). "Systemic coherence" also incorporates aspects of flexibility and regime coherence mentioned in Table 1.

POLITICAL AND ECONOMIC FEASIBILITY

Perceptions of equity and fairness are clearly important for the acceptance of and adherence to a cooperative governance framework. Likewise, the expected economic burden and the distribution of costs and benefits will have a strong influence on whether regime participants are willing to enter cooperative efforts in the first place and whether the regime is sustainable in the medium and long term. Both dimensions involve inherently contingent, epistemologically complex, and highly debatable considerations. Any definition of fairness, for instance, will be invariably contingent on a number of assumptions and preferences and cannot be adequately

Table 2: Assessment Matrix for the Evaluation of International Climate Cooperation Frameworks

Level of Ambition		
High	Medium	Low
Compliance Facilitation and Control		
Strong	Medium	Weak
Institutional Capacity		
High	Medium	Low
Participation and Inclusiveness		
High	Medium	Low
Systemic Coherence		
High	Medium	Low
Political and Economic Feasibility		
High	Medium	Low

Source: Author

captured through anything but the most differentiated and concrete (e.g., survey-based) conceptual framework. Likewise, cost benefit analyses require essentially contested decisions on how to value current and future benefits of adaptation and mitigation, the application of controversial discount rates, as well as calculations of distant, highly uncertain costs. For these reasons, the proposed assessment matrix (see Table 2) includes a broader and more intuitive category of "political and economic feasibility," which loosely incorporates the criteria of cost-effectiveness and dynamic efficiency, equity, and sustainability listed in Table 1.

Conclusion

No single approach to the study of an area as complex as international climate cooperation can hope to capture all variables or anticipate future trends and emerging priorities. What the foregoing exercise has attempted is to build on a survey of approaches to the evaluation of environmental governance frameworks, both at the domestic and the international level, and propose a uniform assessment matrix for alternative approaches to climate cooperation. In so doing, it has singled out six criteria that capture and expand on the central tenets of existing research: level of ambition, provisions for compliance facilitation and control, institutional capacity, participation and inclusiveness, systemic coherence, and political and economic feasibility.

Only the application of this matrix to existing and proposed climate governance frameworks will determine whether the proposed criteria offer a suitable benchmark for the evaluation and comparison of contending climate architectures, regimes, and institutions. Given the dynamic proliferation of existing and proposed venues to advance climate governance, such a framework would seem timely and, hopefully, useful. But as always, this first attempt to systematize further inquiry marks only one stage in an ongoing and open intellectual process.

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