

Institutional Aspects of Implementation, Compliance, and Effectiveness

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In the Framework Convention on Climate Change (FCCC), the world's nations aspired to stabilizing "greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system" (FCCC 1992, Article 2). Central to evaluating this regime lies the question of effectiveness—that is, will the regime achieve that ambitious objective? Concerns regarding effectiveness raise two institutional design questions for any regime. First, how should international institutions be designed to maximize the chances that the regime will achieve agreed-on goals? Second, how should institutions be designed to allow the regime to assess its progress toward those goals? In the years ahead, the climate change regime will seek to accomplish these interrelated tasks of assessing and maximizing effectiveness. The nature of the FCCC regime highlights several obstacles common to other international regimes but also poses several novel institutional challenges. The following section clarifies those obstacles and identifies institutional responses that will help the regime surmount them.

1 Defining Compliance and Effectiveness

Questions about regime effectiveness and compliance have received increasing scholarly attention over the past decade (Bernauer 1995; Brown Weiss and Jacobson 1998; Chayes and Chayes 1995; Mitchell 1996; Victor, Raustiala, and Skolnikoff 1998; Wettestad 1995). Scholars and practitioners use the term *effectiveness* in quite different ways, ranging from something akin to compliance, to economic efficiency, to benefits exceeding costs, to achieving the sought-for environmental improvement

(Young 1992a, 1994a). The question “Is this regime effective?” is often simply a shorthand for “Did this regime accomplish certain goals?” Answering the question, therefore, requires the analyst to define, implicitly or explicitly, the goals against which she will evaluate the regime’s performance. The FCCC eventually will be evaluated against a range of normative and empirical criteria. One common, if ambitious, standard for success asks whether the regime achieved “problem-solving effectiveness,”—that is, whether climate change was averted successfully and whether the FCCC caused, or how much it contributed to, that outcome (Andresen and Wettestad 1995). Less stringently and related to this problem-solving standard, a counterfactual standard asks whether the treaty caused environmental improvements that would not have happened otherwise, even if they fall short of completely solving the problem (Helm and Sprinz 2000; Sprinz and Helm 1999; Underdal 1998b; Young 1992a). For example, some may consider reducing the extent of climate change or delaying it by several decades a success even if eventual arrival is not averted. This latter standard suggests that the Convention, especially initially, may only be “somewhat effective” in solving the problem, but may thereby gain insights that facilitate its own improvement (Levy, Young, and Zürn 1995; Underdal 1992). In this chapter, unless otherwise noted, I use the term *effectiveness* to refer to the regime’s degree of success in addressing the problem that motivated its creation, or what Oran Young has called *problem-solving effectiveness* (Young 1994a).

A regime’s problem-solving effectiveness depends on several factors (Bernauer 1995; Jacobson and Brown Weiss 1995; Victor, Raustiala, and Skolnikoff 1998; Wettestad 1995). Any environmental regime can prove ineffective—that is, fail to accomplish its objective, because of failures of political will, failures of knowledge, or failures of implementation. When confronting the shortcomings of any regime, one should always consider whether the regime was “designed to fail.” Many regimes fail or fall short of their potential simply because member states want to resolve a problem but are unwilling to take the steps and incur the costs necessary to do so. Others fail because governments want to extract whatever political benefits can be gained by negotiating and signing an environmental agreement without expending the resources required to fulfill

the corresponding commitments. These and similar factors often introduce a large gap between the goals laid out in a treaty's preamble and the actual intentions of the member states. Such insincerity often is evident in the far less ambitious "goals in practice" implicit in the operational rules and requirements that the parties adopt. Explaining ineffectiveness in these cases involves considerable attention to the political constraints of low levels of environmental concern and political will, the exigencies of multilateral negotiation, and related factors. If states adopt inherently limited rules—that is, rules that, *even if perfectly complied with*, would not achieve the regime's nominal goals, it raises the question "Why were states unwilling to require actions that could have achieved more?" Such factors constitute important elements in an overall assessment of regime effectiveness but involve problems rather different in nature from the implementation and compliance problems that are the focus of this section.

A regime whose member states sincerely want to resolve an environmental problem may also fail because of ignorance and uncertainty about what rules will move the regime toward the intended goal. Most environmental regimes ultimately seek to improve environmental quality by altering human behavior. But our understanding of the relationship of human behavior to environmental quality varies considerably across issue areas and over time. Unlike arms control, trade, or human rights treaties in which the ultimate goal of international cooperation is to alter human behavior, environmental regimes must choose rules regulating human behavior as an instrumental means to the ultimate goal of environmental improvement. States that genuinely desire to create rules that will accomplish a regime's objectives may adopt rules that fail simply because they reflect then-current but mistaken understandings of the sources of environmental damage and available means of environmental remedial action. The influence of these first two potential sources of regime ineffectiveness can be highlighted by asking, "If all actors fulfilled their regime obligations perfectly, would the regime's objectives be achieved?" Insincerity and ignorance of members place upper bounds on a regime's ability to achieve its goals. In most cases, it seems unlikely that a regime will accomplish (and unreasonable to expect it to reach) more than its member states want to achieve or know how to achieve.

Yet, regimes often fall short of even this standard. A wide range of *implementational* factors create additional obstacles to regime effectiveness. Even a regime whose members adopt the “right” rules may prove less than perfectly effective if those rules are not implemented well. Evaluating implementational failures involves asking, “How far short of their regime obligations did actors’ accomplishments fall?” This corresponds more closely to questions of behavior-changing effectiveness or compliance (Brown Weiss and Jacobson 1998; Young 1994a). People often consider compliance as binary—a state’s behavior either did or did not conform to regime rules. Young’s definition of *behavior-changing effectiveness*, however, urges us to consider not only treaty implementation and compliance, but also situations in which actors:

- Undertake positive behavioral change but fall short of full compliance
- Comply with the spirit but not the letter of the treaty
- Undertake positive behavioral change that exceeds treaty-mandated standards

In short, we should consider regimes effective if they induce positive behavioral changes, even if those changes fall short of, exceed, or differ from the strict legal definitions of compliance (Mitchell 1996; Young 1994a).

The climate change regime, like several other environmental regimes, specifies both behavioral standards for compliance (what acts must or must not be performed) and environmental standards for compliance (what environmental outcomes must be produced). In this section, I use *compliance* to correspond to Young’s notion of behavior change that is consistent with the goals of the regime and to refer to the extent to which an actor’s behavior or the environmental outcomes of that behavior conform to the standards laid out in the treaty. The voluntary nature of the treaty-making process creates expectations that states should fulfill their treaty commitments and comply with treaty obligations (Chayes and Chayes 1995). When behavioral and environmental outcomes fall short of what member states agreed to accomplish, we seek out explanations in terms of failures of institutional design as well as of political will and knowledge. The question of “Why did states fail to even achieve what they sought to achieve?” focuses our attention on issues of institutional design.

2 Obligations under the FCCC

Parties' obligations under the FCCC raise implementational difficulties common to many regimes as well as novel challenges that reflect the innovative character of some obligations and the flexibility allowed to parties in fulfilling them. The 1992 Convention distinguished between industrialized countries and economies in transition, listed in Annex I of the FCCC, and the largely developing non-Annex I countries. In the 1997 Kyoto Protocol, thirty-nine Annex I countries committed themselves to achieving specific limits on their greenhouse gas emissions by the period 2008–2012. The Protocol's Annex B delineates these "quantified emission limitation or reduction commitments" (QELRCs), ranging from 92 percent to 110 percent of 1990 emissions, and aimed at reducing these countries' aggregate emissions to about 95 percent of their 1990 emissions. The Protocol left many implementational aspects for further elaboration, a process begun in 1998 in the Buenos Aires negotiations (see chapter 10). The Annex B commitments constitute only an initial step that fell far short of what most scientists considered necessary to achieve the stabilization called for in the FCCC.

Even achieving these "inadequate" goals, however, requires major behavioral change and enormous resources. To minimize the associated costs, the agreement allows states unprecedented flexibility in how they meet their commitments. The Protocol provides states with four forms of flexibility in meeting their QELRCs by the 2008–2012 commitment period (and making "demonstrable progress" toward that goal by 2005) (FCCC/CP/1997/L.7/Add.1 1997, Article 3). Countries can meet their QELRCs through "trading" of emissions reduction units with other Annex B countries (Kyoto Protocol 1997, Articles 3, 17), "joint implementation (JI)" involving acquiring emissions reductions produced by projects in other Annex I countries (Kyoto Protocol 1997, Article 6), or the "Clean Development Mechanism (CDM)" involving acquiring emissions-reductions units produced by projects in non-Annex I countries that have not accepted emissions-reduction targets (Kyoto Protocol 1997, Article 12). In addition, the "economies in transition" countries are provided "a certain degree of flexibility" in implementing their Annex B commitments (Kyoto Protocol 1997, Article 3(6)). The combination of

Annex B commitments and the flexible approaches to compliance of these Kyoto Mechanisms create a context in which states have committed to ensuring that the aggregate emissions of Annex B countries are reduced by an amount corresponding to a given percentage of their 1990 emissions levels rather than ensuring that each country's individual national emissions are reduced by that percentage. The gains in economic efficiency offered by this flexibility were the major reason for incorporating them into the Convention (see also chapter 13). Yet, the flexibility also introduces unique challenges into the implementation, compliance, and effectiveness of the Convention.

2.1 The Challenge of Dynamic, Differentiated Obligations

The FCCC's rules differ in several respects from traditional treaty rules that require all states to meet a common standard defined in terms of either specified actions or specified outcomes. First, the FCCC creates differentiated and dynamic obligations. Many treaties, particularly recent ones, have adopted "differentiated obligations" that apply different compliance standards to states considered to be in different situations. The FCCC, like the Montreal Protocol regime aimed at reducing ozone loss, differentiates between developed and developing states. In the FCCC case, the former face QELRCs while the latter do not (with the exception of the voluntary commitments of Argentina and Kazakhstan made in Buenos Aires). The commitments in Annex B introduce further variance in commitments, with eight different levels of emissions reductions delineated. The provisions allowing flexibility introduce a novel, dynamic component to the standards each state must meet. Although each Annex B commitment is clear, it is less clear how countries will employ the Kyoto Mechanisms to achieve compliance and what problems they will encounter in doing so. Allowing emissions trading, for example, complicates the process of identifying the level of emissions reductions for which a country is responsible, since each trade effectively increases the reductions required of the state selling the reductions and decreases the reductions required of the state buying them. Thus, a state's required reductions will not be its simple Annex B commitment, but rather that commitment adjusted by its sales and purchases of emissions from other countries.

2.2 The Problem of Establishing Project Baselines

The joint implementation (JI) and Clean Development Mechanism (CDM) provisions of the Kyoto Protocol (see chapter 10) allow a country to fund projects that reduce emissions in other countries (Annex I and non-Annex I, respectively) and use those reductions to offset emissions on its own territory. A difficult analytic obstacle to evaluating such projects is accurate “project baselining.” Assessing the number of emissions reduction credits a country should receive for funding a project requires comparing the actual emissions that the project produced (or carbon equivalents sequestered) to the estimated emissions (or sequestration) that would have occurred had the project not been undertaken.

How much should Germany’s required reductions be changed if the German government finances a fifty-acre Brazilian tree farm that sequesters 1000 tons of carbon per year? Consider three scenarios: the fifty acres would have remained barren without German financing; the fifty acres would not have been replanted but would have had some unknown (and unknowable) amount of natural regrowth without the German financing; and the Brazilian tree farmer would have replanted the fifty acres the same way even if he had not received the financing. On the one hand, we cannot exactly estimate what would have happened without the project and, hence, how many credits Germany should receive for financing the project. On the other hand, both overestimating and underestimating credit levels pose problems. The success of the regime depends on providing governments and private actors with incentives to finance such JI and CDM projects, incentives that stem from the ability to receive credit for a certain amount of emissions reductions that would have been more costly if they had to be produced at home. Systematically underestimating the credits to be earned compared to the “true” emissions reductions reduces these incentives and reduces the effectiveness of the regime. Yet, overestimating true emissions reductions runs the risk of reducing Germany’s target by more than the amount actually achieved by the project, thereby making Germany’s Annex B QELRC less stringent.

Considerable efforts are being made to design ways to resolve these problems and create accurate, credible, and consistent methodologies for estimating such project counterfactual baselines. For many projects, these logical obstacles do not preclude estimating baseline scenarios. For

example, if a utility company was planning on keeping an inefficient power plant in service for ten more years but was financed by an Annex B country to replace it, one might readily calculate the difference in emissions per kilowatt from the existing plant and from the new plant and identify a number of credits that, even if not the “perfect” estimate, would nonetheless be acceptable to all actors involved in the project, to the regime secretariat, and to other Contracting Parties. But establishing a baseline for other projects will prove far more difficult. Indeed, these practical difficulties of forecasting are exacerbated by the possibility for strategic behavior. Actors involved in projects have incentives to *inflate* or overestimate these baseline levels of emissions in order to maximize the emissions reductions the project is credited with producing. Thus, assessing whether a country has met its emissions reduction target depends, at least in some cases, on inherently uncertain estimates of counterfactual project baselines.

2.3 Inducing Compliance through Obligational Clarity, Performance Clarity, and Response Clarity

A regime’s ability to induce behavioral change and compliance by member states depends on several features of the “compliance system” (Mitchell 1996). The regime’s success depends on recognizing when actors conform or fail to conform with their obligations and on responding to conformance and nonconformance in ways that encourage the former and discourage the latter. Although analysts often claim that “a regime’s success depends on monitoring, verification, and enforcement,” such shorthand assumes a largely legal and adversarial model of compliance management that would ignore the many innovative facilitative and market-based elements that are the FCCC’s most unique features (Chayes and Chayes 1995; Downs, Rocke, and Barsoom 1996; Mitchell 1998a).

Compliance problems arise from failures of three types. The first type is a failure of obligatory clarity. The regime needs to provide clarity with respect to “who must do what.” This requires the regime to minimize ambiguities about what behaviors must be undertaken and what outcomes must be achieved, as well as about who is responsible for undertaking or achieving those standards and who is responsible if they are not achieved. A second type of failure involves performance clarity. The re-

gime needs transparency—that is, knowledge about what behaviors relevant actors actually undertook and what environmental outcomes resulted. Reporting, monitoring, and verification provisions seek to address this potential source of implementational failure. A third type of failure involves response clarity. A regime’s success depends on the expectations actors have about how other actors, both within and outside the regime, will respond if it fulfills or fails to fulfill the regime’s rules.

Consider the obstacles faced by the climate change regime’s substantive obligations. The Kyoto Mechanisms (see also chapters 10 and 13) introduce problems of obligational clarity. Emissions trading introduces some problems for the climate secretariat of tracking the new Annex B obligations of buyers and sellers that result from each trade. Far more obligational ambiguity is introduced, however, by the flexibility of JI and CDM projects. The obstacles to accurate baselining delineated above need not introduce obligational ambiguity if baselines are specified at the time of project initiation. However, strong pressures to renegotiate baselines will emerge whenever new evidence demonstrates that baseline assumptions were overly optimistic. In addition, the Kyoto Protocol requires verification that JI and CDM projects produce emissions reductions “additional to any that would otherwise occur” before being used to fulfill the buyer’s obligations under Annex B. This verification can, by definition, only be conducted after project completion. Since a state cannot be sure of how many units a project will be deemed to have produced, a state relying on a project must choose to engage in costly “overcompliance” to ensure it fulfills its Annex B obligations in the event of project shortfall, engage only in projects whose emission reductions can be verified in sufficient time for the state to take additional action to achieve compliance in the event of project shortfall, or risk being charged with noncompliance. Indeed, because guidelines for the distribution of responsibility between buyers and sellers in the event of project failure have yet to be developed, it is still unclear whether a state acquiring emissions reductions from a project that had a shortfall (for which the acquiring state was not responsible) would be allowed to count those reductions toward compliance with its Annex B commitments.

With respect to performance clarity, the wide range of behaviors that emit or sequester greenhouse gases make general claims about the ease

of monitoring relevant behaviors or environmental indicators impossible to formulate (Morlot 1998). In some cases, such as power plant emissions, both relevant activities (e.g., amount of coal or oil burned) and their environmental outputs (e.g., amount of CO₂ emitted) will be relatively easy to monitor. In others, such as deforestation or afforestation, relevant behaviors may prove relatively easy to monitor (e.g., satellite surveillance of net changes in forest cover), but the corresponding impact on emissions may be difficult to ascertain because of the problems in modeling the carbon sequestered or released by particular activities. In yet other cases, even relevant behaviors may be difficult to monitor, as with determining the number of methane-producing livestock being grazed or the levels of greenhouse gas-emitting military activities that governments have strong incentives to keep secret.

Response clarity may be compromised in the climate change context because no one-to-one correspondence exists between behaviors and environmental outcomes. Actors may be uncertain how the secretariat and member states will respond to compliance and violation. Annex B defines compliance in terms of environmental outcomes (emissions levels), and most analysts assume that many contracts for JI and CDM projects will be defined in similar environmental-outcome terms. On paper, this implies that actual behaviors are less important, if not irrelevant, to assessments of compliance. In practice, however, states and substate actors who took actions and expended resources that could reasonably have been expected to reduce emissions by a given amount will argue that they should be treated as if they complied even if emissions exceed those specified. For example, a state could adopt costly programs to upgrade power plants or tax gasoline that they, in good faith, expected to produce particular emissions reductions—but did not. Likewise, unpredictable exogenous shocks (from economic downturns to natural disasters) will lead at least some projects and programs to come up short through no fault of the actors involved. And other states and the expert compliance-review teams envisioned under Article 8 of the Kyoto Protocol are likely to find such arguments compelling, at least in some cases. The fact that such assessments can only be conducted after project completion introduces additional uncertainty about whether resources invested into cut-

ting emissions will “pay off” in terms of credit toward fulfilling treaty obligations.

3 Institutional Design Features to Foster Behavioral Change

The climate change regime will face several types of noncompliance by member states and substate actors. Although some instances of noncompliance will involve intentional efforts to cheat on the agreement, other instances will arise from incapacity or inadvertence. The regime’s effectiveness will depend on its ability to distinguish these different sources of noncompliance and respond in ways that maintain and enhance the commitment of those supportive of the regime’s goals while inducing compliance by more recalcitrant actors opposed to those goals.

Several factors will lead some states and nonstate actors to comply with the FCCC (Mitchell 1994, 32–46). In some cases, complying with regime requirements will coincide with an actor’s self-interest or will not require any behavioral changes. Some countries have sufficiently strong environmental constituencies that they will reduce greenhouse gas emissions regardless of FCCC requirements or the actions of other states. These “unilateral compliers” will be joined by some “contingent compliers,” who will comply once they are assured that enough others will comply and that doing so themselves will not put them at a significant economic or environmental disadvantage.

Despite compliance by some actors, many are likely to violate regime rules (Koskenniemi 1992; Mitchell 1994; Mitchell and Chayes 1995). Some states, particularly developing states, are likely to view preventing climate change as a worthwhile goal that is simply less pressing than other economic or social goals. Others may view the present and real costs of reducing emissions as greater than the future and uncertain benefits. Some regime opponents may explicitly refuse to sign and ratify the agreement. Others, however, may join but seek to violate the regime without being detected. Some states, and some of the substate actors that propose JI or CDM projects, will seek to benefit by undertaking commitments that they do not intend to fulfill. Strong international political pressure to commit to emissions reductions may lead states unconvinced of the dangers of

climate change (or that the benefits of action outweigh its costs) to view it as politically less costly to make such commitments while looking for clandestine ways to violate them than to reject such commitments outright.

Although the climate regime will certainly experience some intentional efforts to cheat or to free-ride on the efforts of others, noncompliance cannot be assumed to reflect these factors. Noncompliance will also arise from incapacity and inadvertence (Chayes and Chayes 1995). “Good faith noncompliance” will certainly occur among those sincerely committed to reducing emissions who fail to comply because of financial, administrative, or technological incapacities (Chayes and Chayes 1993; Greene and Salt 1994; Kimball 1992, 43). The flexibility of the Kyoto Mechanisms introduces considerable uncertainty about what financial, administrative, and technological resources will be needed to achieve a particular level of emissions reductions. The amounts and types of resources required to achieve a given emissions target will vary considerably depending on the policy or project used to achieve them. Particularly since much of the relevant policy, knowledge, and technology is still under development, actors may adopt approaches that require far more resources than they expect or have available. To give but one example, a windmill farm built to replace a coal-fired power plant may cost more to build than expected and provide less energy than planned if the technology proves less efficient than forecast. These problems are exacerbated by the incentives of proponents of action to be overly optimistic and hence underestimate the amount of—and uncertainty regarding—the resources needed to accomplish target reductions. Even fully capable actors may adopt policies or take actions sincerely intended to achieve certain reductions that inadvertently fail to do so. A carbon tax chosen to produce a given reduction in carbon emissions may come up short due to inaccuracies in the underlying economic model unknown at the time, misestimation of model inputs, or many other factors (Epstein and Gupta 1990; Victor and Salt 1994, 8). The desire to promote innovative approaches to emissions reductions makes these types of noncompliance particularly likely.

Obviously, the regime must have compliance institutions that maximize total emissions reductions. Achieving that goal, however, cannot

be assumed as synonymous with maximizing the likelihood of detecting and punishing intentional violators. Policies that deter those who seek to cheat or otherwise undercut the agreement may be counterproductive in response to actors who sincerely seek to comply and further regime goals. Economic sanctions intended to alter a state's policy often induce a strengthened commitment to that policy (Galtung 1967). Even worse, policies that assume that noncompliance reflects intentional efforts to cheat may be wrong when first implemented, but they may initiate dynamics that worsen relations among states and decrease commitments to regime norms over time. A more effective strategy will consider the full range of reasons for noncompliance and design institutional policies that identify when noncompliance occurs, discriminate among the different causes of noncompliance, and respond to each in ways likely to increase positive behavioral change in the future. Designing such a compliance system can be thought of as involving a primary rule system that provides obligational clarity, a compliance information system that provides performance clarity, and a noncompliance response system that provides response clarity (Mitchell 1994).

3.1 A Rule System That Provides Obligational Clarity

As already noted, the Kyoto Mechanisms create a context in which the obligations of state and substate actors may change over time and, in some cases, may be uncertain. The secretariat will need to maintain a list of each Annex B country's "adjusted emission limit" based on its initial Annex B commitment and any emissions trades (Tietenberg and Victor 1994). Even if an active emissions-trading market develops, tracking all trades and updating each state's total emissions reduction target should not pose particularly serious problems, although it does diverge from the traditional model of simply referring to the treaty text. The system also will need to track the number of units and identity of the participants in each trade to deal with noncompliance problems that may arise later. Designing an adequate obligation-tracking system does not appear to be a particularly demanding task.

The Kyoto Mechanisms will introduce obligational ambiguity, however, to the extent that any actors' obligations are contingent (by law or in practice) on the full performance of other actors. Emissions trading

among governments and JI and CDM projects by substate actors involves agreements in which an actor with an emissions-reduction obligation contracts with another actor to take the actions needed to fulfill that obligation. Such contracts introduce potential ambiguity about the responsibility for fulfilling the obligation. Legal obligations in most international regimes cannot be transferred from one actor to another. By allowing such transfers, the Kyoto Mechanisms raise the question of whether the “original obligatee” or the “proxy obligatee” is responsible if the agreed-on reductions are not achieved. Contrast the provisions for JI and CDM projects. The ability of a country to apply emissions reductions acquired from a JI project to its QELRC depends on all countries involved in the project being in compliance with the terms of the project agreement. The CDM provisions and emissions-trading provisions, by contrast, leave questions of accountability up to subsequent elaboration by the Conference of the Parties. Thus, it is not yet clear whether the obligations of a state otherwise in compliance are contingent on the actual behavior of other parties to a CDM project or trade or merely on the agreed behavior of those parties. Particularly since assessing which parties’ actions caused a project to fail can only occur at the time of project completion, considerable uncertainty will exist regarding what obligations various actors have. These problems can be mitigated if negotiations eventually clarify what obligations parties to CDM projects and emissions trades have in the case of project failure. But even exceptional legal clarity will not prevent a host of political considerations from leaving uncertainty in the minds of many actors as to who will be held responsible for certain obligations if noncompliance occurs. As the regime develops procedures for allocating responsibility for noncompliance, it will need to consider how those procedures influence not only the actors involved in the particular case but also the willingness of other actors to undertake such projects and trades in the future.

3.2 An Information System That Provides Performance Clarity

Flexibility mechanisms create more difficulties with respect to performance clarity than obligational clarity. Assuming an actor’s obligations are clear, the regime’s compliance institutions must ensure that evidence of the actor’s behavior is equally clear so that the two can be compared

as a basis for a response. Obstacles to transparency about actor performance arise from problems common to many other international regimes as well as from problems particular to the regulatory approaches adopted in Kyoto (Mitchell 1998b). What aspects of an actor's performance must be observed depends on how compliance and performance are defined under the Protocol and under any related trade or project agreements. Behavioral standards and environmental standards present distinct types of performance criteria that introduce different monitoring and transparency problems.

The logic of fostering economic efficiency argues for the superiority of environmental outcome standards since they allow actors maximum flexibility in the behaviors they undertake to achieve a desired environmental goal. At first glance, this seems to imply that behavior need not be monitored—environmental monitoring alone would provide the evidence needed to evaluate performance and assess compliance. However, as the JI and CDM provisions explicitly state, emissions reductions must result from project activity and be “additional” if they are to count toward national obligations. That is, compliance involves not merely observing an environmental outcome but assessing that outcome relative to a baseline defined as what would have happened “in the absence of the . . . project activity.” Thus, demonstrating additionality by way of the counterfactual baseline assessment requires reference to relevant actors' behaviors as well as environmental outcomes to determine whether the former caused any observed change in the latter. In some cases, a project's environmental impact will be assessed simply by estimating it from the change in behavior relative to the behavior expected otherwise. In others, where direct environmental monitoring is used, it will be difficult to determine whether the project activity was the cause of any environmental change for two reasons. First, changes in ambient atmospheric environmental conditions, even if limited to an area exactly coincident with the project, will reflect the influences of numerous other activities. Thus, determining whether the project caused those changes will be difficult at best and will, at least, require monitoring of behavior as well as environmental conditions. Second, most environmental indicators of aggregate greenhouse gas levels (even in limited areas) are likely to be increasing. The impact of most projects, therefore, will be evident is a slower rise in

greenhouse gases rather than an actual reduction. More broadly speaking, any baseline assessment requires determining whether a project caused observed environmental changes (and therefore deserves to have those reductions counted toward project or national obligations). Such counterfactual assessments are complicated both by uncertainty regarding whether a reduction actually occurred and, if so, whether that reduction was caused by the project.

In addition, the regime needs information on both behavior and environmental indicators to identify which actor was responsible for noncompliance and whether the noncompliance was intentional or was due to incapacity or inadvertence. Given these tasks, the regime will need to gather information on behavior even when compliance is defined exclusively in terms of environmental quality. Indeed, precluding irresponsible actors from shifting the blame for project failure onto others or from taking undeserved credit for project success while avoiding blaming responsible actors for project failure caused by factors outside their control requires that the compliance system monitor any relevant behaviors that influence the environmental indicator of interest. For example, a factory that contracted to upgrade its equipment to reduce emissions by 20 percent might fail to upgrade any equipment but nonetheless reduce its emissions by 20 percent due to a drop in sales and a corresponding drop in production. In this case, the factory met the environmental standard but not the criteria that reductions be “additional” and “result from” the project. In contrast, a developing-country corporation carrying out a CDM reforestation project that planted and nurtured a more-than-adequate number of trees to sequester the contracted amount of carbon might have its grove wiped out by a flood or hurricane. In this case, the environmental standard was not met due to factors outside the responsible party’s control. The ability of the regime’s compliance system to discourage projects like the former and encourage those like the latter, despite its failure, will depend on monitoring both behavior and environmental impacts. Unfortunately, few other regimes use such a project-based approach and so development of such an evaluation system will have few empirical examples from which to learn.

Even if it were possible to adequately define and monitor compliance based on environmental indicators alone, the long-term success of the

regime depends on fostering innovative programs and then assessing which ones most effectively reduce or sequester emissions. Such assessments require analysis of the relationship between, and hence collection of information on, human behaviors and environmental impacts. The climate change regime's long-term success depends on being able to determine, for example, how and why one reforestation project was able to sequester more carbon with fewer resources than a contractually similar project. Only by examining both human behaviors and environmental outcomes can the regime encourage projects and policies that transform human resources and action into greenhouse gas reductions efficiently while discouraging those that do so less efficiently (or not at all).

Gathering regular, accurate information on behavior and environmental outputs has proved quite difficult in a range of environmental treaties (Mitchell 1998b). Although some countries required to report under the FCCC have provided full reports on time, many other reports have been late, incomplete, or nonexistent (FCCC/1995/Inf.3 1995; FCCC/A/AC.237/81 1994; Morlot 1998, 29). These problems will increase as new protocols add more extensive reporting requirements, and "independent verification" becomes of "crucial importance" in the JI and CDM mechanisms (Anderson 1995, 16; Luhmann et al. 1995, 10; Michaelowa 1995, 13). Addressing these and related problems suggests adopting several institutional procedures that have proved successful in other international environmental regimes (Mitchell 1994, 318–322). In terms of self-reporting, required data must be made easy to collect and report, must be based on clear formats, and must facilitate subsequent evaluation. The secretariat needs to process and disseminate this information in ways that further the goals of entities responsible for reporting. The compliance information system should include such self-reporting by states and substate actors but should also include independent reporting, monitoring, verification, and on-site inspection (di Primio and Stein 1992; Fischer 1991; Sachariew 1991). Gathering compliance information will be facilitated by involving environmental NGOs and corporations that have independent incentives to serve as watchdogs, monitoring policies, behaviors, and environmental quality (Mitchell 1994, chap. 9; Morlot 1998, 38; Tietenberg and Victor 1994, 28–29). The FCCC also will have to resolve the tension between the need to verify treaty-related information through

independent and sometimes intrusive measures such as satellite monitoring, atmospheric sampling, and on-site inspections, and the significant political resistance to such procedures (Honsch 1992; Lewis 1992). Finally, once such information is collected, the secretariat will need procedures to review and assess the information (Avenhaus and Canty 1992; Grubb and Steen 1991; Victor and Salt 1995). Models for the types of problems the FCCC will face, and the solutions to them, exist in the systems used by the whaling regime to collect self-reports on whale catch, by various International Maritime Organization regimes to collect information from government surveillance and inspection agencies as well as directly from ship captains on pollutants discharged at sea, and by the European acid rain regime's efforts to catalog and analyze emissions and transborder fluxes of various emissions. The quality of the reporting and assessment mechanisms developed will prove crucial to the regime's ability to induce behavioral changes that protect the global climate as well as to its ability to know whether such changes are occurring.

3.3 A Response System That Provides Response Clarity and Differentiated Responses

The climate change regime also will need to develop a compliance response system—that is, a set of institutions and processes for evaluating the relationship of a state or substate actor's actual behavioral or environmental performance against its obligations under the treaty or a treaty-related agreement or contract (Mitchell 1996). Many international relations theorists assume this requires credible and potent sanctions (Downs, Rocke, and Barsoom 1996). Indeed, FCCC negotiators face numerous pressures to adopt traditional deterrent-based approaches to enforcement, such as economic sanctions, legal penalties, and private enforcement, as the best way to enhance conformance with FCCC obligations (Dudek and Tietenberg 1992, 241–245; Tietenberg and Victor 1994, 32; Werksman 1998).

The FCCC is likely to be most effective, however, if it maintains a range of response options, using them strategically within a model of active compliance management that responds to a given type of noncompliance in the way most likely to induce future compliance (Chayes and Chayes 1995; Chayes, Chayes, and Mitchell 1995). One type of response is unlikely to

fit all types of noncompliance. The international and national components of a compliance response system will need to determine why a given state or substate actor failed to meet its commitments. Doing so requires developing procedures for authoritatively determining different causes of noncompliance and providing relevant actors with clear expectations about how the system as a whole is likely to respond to compliance, non-compliance due to inadvertence or incapacity, and intentional violation. Thus, the system might develop a “schedule” of responses in which behavior and environmental impacts were assessed and then intentional violations were sanctioned, noncompliance due to incapacity received technical or financial assistance, noncompliance due to inadvertence was given an opportunity to make good on its commitments, and compliance was rewarded. Of course, the effectiveness of such an approach depends on the credibility that actors associate with the schedule of responses.

Such a system must begin, of course, with a system to carefully assess available information to determine the causes of noncompliance and the appropriate response to it. Particularly vis-à-vis developing states, the FCCC has adopted a system “to avoid confrontation, to be transparent” and eschew sanctions in favor of cooperative measures for “assisting Parties to comply with the Protocol” (FCCC/CP/1995/Misc.2 1995, 6). This approach assumes that most non-Annex I party noncompliance will arise from incapacity, not intention. However, a more discriminating system is likely to be more effective, since reward-based strategies provide actors with incentives to disguise intentional violations as incapacity in order to extract resources from other states (Darst 1997). Evidence from several cases of exchanging financial aid for environmental performance suggest that reward-based systems do, indeed, risk moral-hazard problems (Keohane and Levy 1996). As the Kyoto Protocol makes particularly clear in the CDM provisions, emissions reductions will need to be independently certified by experts in the appropriate fields. Likewise, the efficiency promised by a market in emissions reduction units depends on independent verification of trades to ensure their value and credibility (Tietenberg and Victor 1994, 17–18). Besides determining what reductions occurred, the regime will need to assess which parties to JI and CDM projects or emissions trades should receive credit for success or be liable for failure. The regime will need to evaluate claims of states and substate actors that

have sold emissions rights but claim their noncompliance with their adjusted emissions target is due to inadvertence or incapacity.

Once the system determines the causes of any observed noncompliance and assesses which actors, if any, should be liable for such noncompliance, the system must determine how to respond most effectively. The goal of the system should be to respond in ways that target the source of noncompliance and promote future compliance. As a first approximation, this could involve providing the financial, administrative, or technical resources deemed lacking in cases of incapacity; providing technical advice and new, extended, but specific compliance deadlines in cases of inadvertent policy or program failure; and adopting sanctions in cases of intentional violation (Goldberg et al. 1998). Effectiveness is also likely to be fostered by rewarding compliance. Providing positive incentives for compliance and for positive behaviors that produce emissions reductions larger or sooner than required could help the regime achieve aggregate environmental improvements that exceed rather than merely meet the goals established. In short, the response system must be able to differentiate compliance from noncompliance; furthermore, to differentiate noncompliance due to inadvertence, incapacities, and intentionality; and induce differentiated responses to behaviors and outcomes that make goal-promoting behaviors more likely in the future than at present.

Sanctioning those assessed as having intentionally violated their commitments provides those actors with incentives to bring themselves into compliance while simultaneously deterring others who might be tempted to intentionally violate in the future. Considerable evidence suggests that sanctions can be effective at influencing behavior, at least under some conditions (Hufbauer, Schott, and Elliott 1990; Pape 1997). Unfortunately, governments often prove reluctant to impose trade sanctions or other penalties on other states, because of collective action problems and the costs to the sanctioner of sanctioning. Nor are governments likely to empower some centralized FCCC enforcement authority to do the job (Sands 1993, 389). The FCCC could facilitate sanctioning by removing legal barriers that inhibit those predisposed to enforce the agreement—for example, altering World Trade Organization rules to permit trade sanctions in response to FCCC noncompliance (Mitchell 1994, 322; see also chapter 13 of this volume). And governments may engage in various

forms of collective opprobrium, such as diplomatic shaming and jawboning, that may induce compliance (Chayes and Chayes 1993, 1995; Mitchell 1994). Unfortunately, experience suggests that sanctioning is unlikely to be sufficiently frequent or severe to alter the noncomplier's behavior in many cases.

These obstacles to an effective sanction-based system and the recognition that sanctions are not appropriate when noncompliance is not intentional has prompted interest in alternative approaches. The best response to noncompliance that stems from incapacity, of course, is to provide the financial, administrative, or technical resources needed to remedy the incapacity. Financial and technology transfers and training may prove most helpful when capacity rather than will is the source of the problem. The international wetlands convention has sought to prevent wetlands degradation by providing technical advisors to countries experiencing difficulty doing so on their own while also publishing a list of wetlands at risk that provides a basis for mobilizing either assistance or shaming. Unfortunately, such programs require funding from governments and/or NGOs, and experience with the Global Environment Facility and technology transfer programs demonstrates that governments often prove as reluctant to fund such programs as they do to impose sanctions (French 1994, 96; Keohane and Levy 1996; Victor and Salt 1994, 15). Indeed, governments have yet to develop mechanisms to induce developed countries to provide the funds needed by developing countries to contribute to the goals of the Convention. When noncompliance stems from inadvertence, the best approach for the regime may be to provide various avenues for the noncompliant party to bring itself into compliance. These avenues could include a specified but extended deadline for compliance, allowing the post hoc purchase of emissions credits from parties that have reduced below their QELRC, or contributing to the Convention's financial mechanism in an amount sufficient to fund the quantity of reductions needed to bring it into compliance (Goldberg et al. 1998, 22–23).

Finally, provisions should be made to reward overcompliance and innovation. Precisely because current emissions reduction targets fall far short of what most scientists consider necessary to avert climate change, significant progress requires incentives for going beyond what is required and for undertaking risky projects that provide uncertain, but potentially

large, reductions at low cost. Countries, corporations, and NGOs that exceed their required emissions reductions should be rewarded by creating awards and a “white list,” by providing access to the Convention’s financial mechanism if appropriate, by reducing the verification requirements imposed, or by other similar incentives. Over the long term, such rewards will be crucial to reducing greenhouse gas emissions at rates above those delineated in the FCCC.

3.4 An Evaluation System That Learns from Experience

The FCCC is unlikely to “get it exactly right” at first. The novelty of the policy approaches and the uncertainty of the science and technology involved mean that the FCCC should constantly seek to improve its effectiveness over time rather than to achieve effectiveness. This requires looking at the overall performance of the system, rather than the success or failure of individual JI or CDM projects, or the compliance or noncompliance of individual states. The regime must self-consciously evaluate and refine the overall compliance system to maximize the emissions reductions achieved over time. The regime should conduct its own regular self-evaluations but should also encourage NGOs and other interested actors to evaluate the system against the FCCC’s goals.

The FCCC must manage a complex portfolio of different Annex B commitments, JI and CDM projects, and emissions trades to maximize aggregate emissions reductions. The best mix of such programs is likely to include considerable innovation with attendant risks of failure. As with individual stocks in an aggressive mutual fund, individual project or program failures need not threaten the overall goals of the system. Relevant lessons may be drawn from individual projects, and from patterns across projects and programs. For example, evaluating whether reforestation projects consistently outperform (or underperform) equal-cost energy-efficiency projects would allow efforts to be channeled into projects that produce the largest reductions at a set cost. Similarly, large, cross-project analyses will allow the discovery of ways to improve baseline estimation techniques. The real success of the regime requires determining the causes of large trends across projects and states as well as the causes of success and failure of individual projects or of compliance and noncompliance by particular states. Such project assessments, analyses, and lessons

should be made widely available so state and nonstate actors can use the lessons in designing and implementing subsequent projects and programs. Establishing and maintaining open lines of communication among project participants, between participants and the secretariat, and with all interested parties will allow all those interested in fostering the regime's success to have the best possibility of doing so.

4 Conclusion

Will the nations of the world achieve the goals they set for themselves in the FCCC? Many years will need to pass before any serious assessment can be made of that question. Indeed, the treaty will never solve the problem of climate change but will, at best, find ways to manage the problem over time. Successfully accomplishing even that more limited goal requires the regime and its member states to establish primary rules, compliance information systems, noncompliance response systems, and a program evaluation system that provide clear expectations about what is required, distinguish intentional from unintentional noncompliance, and encourage compliance while discouraging noncompliance. These represent considerable demands for a secretariat and associated institutions that are likely to be consistently underfunded, understaffed, and overworked (Mitchell and Chayes 1995). Even with the best-designed compliance system imaginable, the effectiveness of the regime at inducing the economic, social, and political changes necessary to avert climate change will depend on nations, corporations, NGOs, and individuals dedicating significantly greater resources to the task of preventing climate change than they have dedicated to any previous environmental problem.

Having discussed the political implications of the climate change regime and the challenges of compliance and implementation of the climate policies of the FCCC and the Kyoto Protocol, it is important to assess the place of the climate change regime within the general framework of international environmental accords. What are the common aspects and what are the differences? Can one draw some inferences for the climate change regime from the experiences of other environmental accords? These issues are addressed in the following chapter.

Note

This chapter is dedicated to the memory of Abram Chayes. My thinking on the issues discussed here has been influenced by my work with Professor Chayes and Antonia Handler Chayes (see Chayes and Chayes 1995; Chayes, Chayes, and Mitchell 1998; Mitchell and Chayes 1995), with Oran Young's regime effectiveness project (Young 1999), and with Edward Parson (Mitchell and Parson 1999). I wish to express my appreciation to all four scholars for their insights on these issues. The chapter has also benefited from comments by the editors and other contributors to this volume.