Promoting **meaningful compliance** with **climate change** Commitments

Prepared for the Pew Center on Global Climate Change

by

Eric Dannenmaier
North-South Center
Environmental Law
Program

Isaac Cohen
INVERWAY, LLC

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Contents

Foreword *Eileen Claussen, President, Pew Center on Global Climate Change*

The ultimate success and credibility of the Kyoto Protocol to the United Nations Framework Convention on Climate Change, or any future climate agreement, will depend on whether most, if not all, Parties meet their greenhouse gas emission reduction commitments. A critical factor in achieving this goal is having a system that is able to identify, sanction, and also deter non-compliance. Traditionally, international agreements have had weak or ineffective compliance systems because of sovereignty concerns. There are, however, means outside the compliance regime of the Protocol to work toward similar outcomes.

The Pew Center has commissioned this report to provide insights on several factors that are often overlooked in the debate on compliance: the role of national compliance systems; national and international monitoring and verification; and the willingness of Parties to participate in the climate change regime. These three factors can significantly contribute to achieving a meaningful and effective compliance system.

The report concludes that:

- National compliance systems should be promoted as a means to ensure compliance with the Kyoto Protocol or any future climate change agreement and should seek to balance market-based instruments with strong enforcement;
- National compliance with international climate change agreements must be verifiable to ensure credibility, and monitoring and verifying compliance with the Kyoto Protocol can benefit significantly from integrating existing national compliance systems into the international system; and
- Broad participation in any climate change regime is as important as meeting the commitments of the agreements themselves; the Kyoto Mechanisms can play an important role in boosting both participation and compliance.

The importance of Parties actually complying with their targets cannot be overstated. While this report outlines benefits from having flexibility and balance in compliance regimes, the damage from non-compliance — even if later remedied — can be a loss of the trust and good faith that underpins international agreements. We prefer the approach to compliance described in this report rather than ensuring compliance by making the rules weaker.

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Executive Summary

As Parties to the UN Framework Convention on Climate Change hammer out the details of Kyoto Protocol implementation, a central issue has been how to guarantee compliance with the commitments being made to reduce greenhouse gas (GHG) emissions. Clearly, the promises of the Framework Convention and the Protocol cannot produce desired results unless the pledges are met.

Yet meeting those pledges is a complex task because the economic and social behaviors that drive anthropogenic GHG emissions occur across a broad array of sectors and reach almost every facet of modern life. The ability to assure compliance with GHG emission reduction commitments is constrained by the inherent nature of the commitments — focused on environmental results rather than observable behaviors — and by the nature of multilateral environmental accords, where compliance is more often a matter of will than compulsion.

Despite these constraints, progress under multilateral climate change regimes requires that emission reduction commitments be fully met, at a domestic level, by the broadest number of Parties. In short, the success and credibility of the Kyoto Protocol, or any future climate accord, will depend upon *meaningful compliance.* This report explores the importance of meaningful compliance in the context of climate change and examines some of the principles and strategies that can help reach that goal.

Recognizing that the compliance regime under the Kyoto Protocol is still the subject of debate and that rules and institutions are still being designed internationally and domestically, the report does not speak expressly to this debate, nor offer guidance on underlying policies and measures to implement the Protocol. It focuses instead on three compliance concerns that the authors believe are fundamental to any meaningful regime and may have special priority for climate change. The report explores how meaningful compliance can be advanced where:

- *National compliance systems* are promoted, consistent with domestic priorities and legal tradition, as a core strategy to meet international commitments;
- *Monitoring and verification* are made routine and credible through cooperative effort and integration with national systems; and

- *Participation* in the Kyoto Protocol, and in efforts to meet broader climate change policy goals, is encouraged among the broadest possible range of states.

These factors may not be sufficient to guarantee the ultimate success of an international compliance climate change framework but, the authors suggest, they are necessary to make any real progress.

Examining the first of these concerns, the report looks to compliance regimes that begin at home — on the domestic policy front — albeit with cooperation and multilateral support where needed. The authors reason that the role of states as regulators — translating their international climate change commitments to domestic action — is critical. States are more capable than multilateral institutions of adapting policy choices to their national needs and priorities, and better able to claim jurisdiction over relevant entities where necessary to compel attention to those choices. Concerns about sovereignty that complicate international compliance and limit international institutions can be minimized when compliance efforts are undertaken in a national context under the rules of the prevailing legal system.

Examining relevant national models, the authors find that legal frameworks that balance supportive and adaptive tools with corrective measures can promote compliance domestically. The report highlights successful frameworks that have achieved this balance while establishing a regulatory baseline of minimum standards and giving compliance institutions the flexibility to obtain environmentally sound results. The report also examines how the choice of consequences other than penalties can be used to promote compliance, and how the allocation of penalties, when collected, can be shaped to serve the objectives of GHG emissions reductions more directly.

The authors review the role of voluntary compliance programs and conclude that they may be important supplements to, but not substitutes for, enforceable targets and government oversight. They also conclude that self-assessment and reporting can significantly increase cost-efficiency, and that incentives, including steps to minimize liability for self-reported problems, might be useful in promoting a greater use of self-auditing programs.

The authors also review the fundamental role that civil society can play in promoting effective compliance at a national level, and explore how expanding this role through access to information, policy formulation, and compliance proceedings can help achieve GHG emissions reduction goals.

Taking their analysis of national strategies back into the context of the Framework Convention and the Kyoto Protocol, the authors argue that monitoring and verifying compliance with climate change commitments are critical to assuring the integration of climate commitments into national systems. Yet they note that such oversight will be uniquely challenging because emissions will be estimated, not directly measured, and because implementation strategies will vary greatly.

In light of these challenges, the report outlines principles and strategies for effective monitoring and verification and discusses their relevance in the climate change context. The report examines how direct inspections and monitoring, transparency and openness, independent study and verification, redundancy, and false-reporting deterrence can serve as oversight tools, adding certainty and credibility to compliance assurance.

The authors also highlight reliance on international and regional cooperation — already at the heart of the Framework Convention and the Kyoto Protocol — as a basis for collecting and verifying credible data. Research, information exchange, data gathering, and scientific exchanges envisioned by the Parties to promote the general goals of the accords can also be used to support performance monitoring and verification by building trust and allowing access to compliance data and performance issues on a real-time basis. This cooperative approach may also help uncover concerns before they lead to systemic failures, and thus promote corrective action even as performance is monitored.

The report explores the importance of using national compliance systems as data sources for multilateral monitoring, and integrating the work of national agencies with international compliance and verification institutions. The authors suggest that the international emissions reporting process will gain credibility where estimations are drawn as directly as possible from domestic systems rather than a separate process designed solely for the purposes of the Kyoto Protocol. Efficiencies and accuracy can also be realized where domestic compliance institutions play a direct role as national focal points for GHG emissions reporting and verification.

Finally, the authors examine an issue not always tied to the compliance debate — the question of how to promote participation of Parties in the climate change regime. If meaningful compliance is to achieve real environmental results, some attention must be paid to the number of countries actually willing to pursue those results. This is particularly true of the Kyoto Protocol Annex B commitments, where

success is defined as an aggregate average of emissions reductions. The Protocol, almost by definition, cannot be effective if only a handful of states accept and observe its conditions. In essence, a regime that promotes national participation as well as national performance can help assure the Protocol's long-term success.

Thus, the authors examine how a climate change compliance regime might be designed to be compelling to participants even as it compels performance. They suggest that nationally distinct compliance systems, tied to an integrated and cooperative international monitoring effort, can promote greater participation of Parties in the climate change regime — through the Framework Convention, the Kyoto Protocol and beyond.

In sum, the authors' analysis of these three separate but related themes of national compliance systems, monitoring and verification, and participation lead to the following principal findings:

1. Meaningful compliance with climate change commitments can best be achieved where promises made internationally are embraced domestically (promoting behavioral change within communities whose actions are most likely to achieve results), and where participation is maximized across the broadest possible range of states.

2. National compliance systems should be promoted as a core strategy for assuring compliance with the international climate change regime because states are more capable of making policy choices suited to their national needs and priorities, and better able to claim jurisdiction over relevant entities where necessary to compel attention to those choices.

3. Effective national compliance systems tend to balance and combine market-based mechanisms and incentives with regulatory models suited to domestic priorities — emphasizing supportive and adaptive measures, but leading to corrective and punitive responses where necessary.

4. Monitoring and verifying compliance will be substantially aided by using the cooperative mechanisms of the Framework Convention and the Kyoto Protocol in part to oversee and complement national data gathering and emissions estimation, and by integrating existing national compliance mechanisms and institutions into the international system.

5. Broad state participation in climate change regimes may be as important as national performance, and any meaningful compliance system should seek to encourage participation even as it discourages non-compliance.

I. Introduction

Governments have begun to rise to the challenge of combating global climate change through two central agreements designed to reduce greenhouse gas (GHG) emissions and sequester carbon without impeding economic growth or disrupting sustainable development. The first of these, the Framework Convention on Climate Change (Framework Convention), calls for study, progressive action, and concerted effort. More concrete steps would be taken under the more recent Kyoto Protocol to the Convention, where specific numeric targets are set for most industrialized nations.

Yet, when examining commitments made under the Framework Convention, the Protocol, or some future agreement, decision-makers must ask a fundamental question: How to assure that these commitments are fully met, at the domestic level, by the broadest number of Parties? In short, how can *meaningful compliance* with climate change commitments be obtained?

A. The Idea of Meaningful Compliance

Some authors describe a difference between basic compliance*, or technical conformity with an established regulatory standard, and* effective compliance*, or behavioral change that meets both the letter and spirit of a rule.*[1] The idea of meaningful compliance borrows to some extent from each of these models to suggest that the positive environmental results sought by the evolving international climate change regime — reduced global GHG emissions — will be best achieved where promises made internationally are embraced domestically and where participation in the regime is maximized across the broadest possible range of states.

By looking to domestic application, meaningful compliance is not meant to address domestic policy instruments (sometimes referred to as "policies and measures" or PAMs), but rather focuses on the mechanisms for securing compliance with those instruments. Put another way, it is less concerned with the specific behaviors that states will ask of their citizens than the means by which they will ask and the methods they will use to obtain an appropriate response. This focus on domestic compliance recognizes

that the state is better suited than any international instrument or institution to promote compliance by domestic regulatory targets. The performance of state compliance systems, in turn, can be assured through international monitoring and verification.

Broad participation in the international climate regime is also critical to achieving meaningful compliance, although it is not often identified as a compliance issue *per se*. While some countries represent a larger share of emissions, solutions limited to a small group of states would be inequitable as well as impractical. The Framework Convention recognizes that the responsibility for addressing climate change is common but differentiated and that, in an increasingly diverse and global economy, reductions in GHG emissions in one country could be easily countered by increases in another. Thus, meaningful compliance will depend on the willingness of a broad range of states to make emissions reduction pledges even as it depends on those pledges being translated to domestic action.

Structuring meaningful compliance policies is a daunting task that will no doubt require Parties to develop and adjust strategies for many years to come. Fortunately, work has already begun at the international level through the Climate Change Secretariat and the negotiating group on compliance (under the Conference of the Parties), and at the national level within environmental institutions in a number of countries.

This report cannot possibly review, much less meaningfully examine, the range of efforts that are ongoing, nor effectively provide comprehensive guidance for achieving meaningful compliance in the sense described above.[2] Instead, the authors examine three key issues that must be addressed to assure progress, finding that meaningful compliance can be advanced where:

- *National compliance systems* are promoted, consistent with domestic priorities and legal tradition, as a core strategy to meet international commitments;
- *Monitoring and verification* are made routine and credible through cooperative effort and integration with national systems; and
- *Participation in the Kyoto Protocol,* and in efforts to meet broader climate change policy goals, is encouraged among the broadest possible range of Parties.

These three elements are not sufficient to guarantee the success of the Framework Convention or the Kyoto Protocol, yet they are necessary (at a minimum) to assure that progress is made.

B. Existing Climate Change Commitments

The Framework Convention promotes the development of climate change policy at a national level, but leaves the details to be determined on the basis of national interests and priorities. The Kyoto Protocol, by contrast, sets numeric targets for most developed countries, listed in Annex B to the Protocol.

The Framework Convention contains a basic requirement that all Parties estimate emissions and report them through periodic emissions inventories that form part of "national communications."[3] The Protocol goes further and requires that Annex I Parties conduct an annual inventory of GHG emissions and incorporate "necessary supplementary information" to ensure compliance in their annual inventories and national communications.[4] The reports are to be assessed by expert review teams, and compliance questions reported to the Conference of the Parties (COP).[5] While details of the process are still being outlined, any consequences resulting from a finding of non-compliance will be determined through procedures to be approved by the COP serving as the meeting of the parties to the Protocol.[6]

Neither the Framework Convention nor the Kyoto Protocol mandate specific domestic policies to assure compliance, but international support and cooperation for domestic programs is contemplated. Summaries of compliance-relevant provisions of the Convention and Protocol are provided in Appendix A to this report.

C. Compliance Models

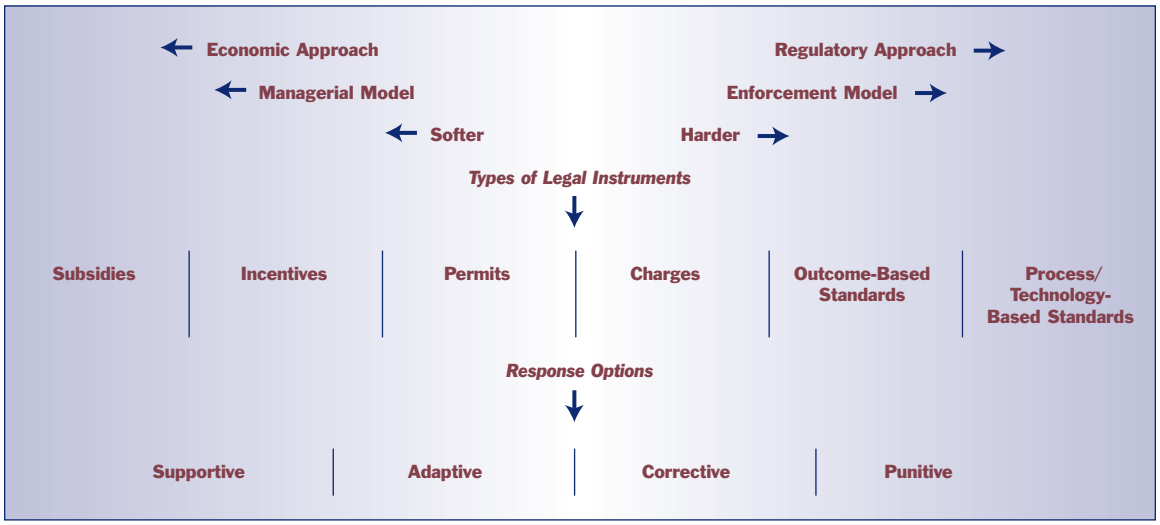
Legal tools to promote compliance tend to fall along a continuum that can be described as ranging from more economic or market-oriented approaches to more regulatory or punitive approaches. One can also describe a continuum in terms of "soft" versus "hard" approaches, referring to the level of coercion threatened to promote compliance. Chayes and Chayes (1995) have also described a "managerial model" of cooperation and problem-solving versus an "enforcement model" that threatens sanctions in instances of non-compliance.[7] This may be generally seen as a soft versus hard distinction, although the "softer" approaches in the Chayes model are combined with intervention rather than simply a lighter sanction.

These models do not necessarily operate in tandem, as tools may be more or less coercive within either the market or regulatory paradigms. For example, a regulatory discharge limit can be promoted through economic tools such as accelerated depreciation on control technology, and still enforced

through substantial penalties where the limit is not attained. Yet there does tend to be a coincidence among economic, managerial, and softer approaches on one hand and among regulatory, enforcement, and harder models on the other, and it is useful to view them as related tools along a continuum. The models can be represented by the diagram in Figure 1.

Figure 1

Compliance Continuum



This diagram is not meant to suggest that compliance practices are linear or exclusive, as many policies do not neatly fit into one or another side of this continuum, and compliance tools are rarely used in isolation. For example, there is nothing inherent in market approaches that would prohibit the imposition of substantial penalties, and no reason why more regulatory models cannot integrate soft components. Thus, while the continuum describes approaches that are often segregated as a matter of regulatory philosophy, these styles are also used in combination, both in the manner in which standards are set, and in the type of actions taken to enforce compliance with those standards.[8]

It should also be noted, as the diagram highlights, that the dichotomy between softer and harder models can be used to describe implementation policies (termed "legal instruments" in the diagram) as well as compliance, or response, options. While the former are outside the scope of this paper, there are times when the two cannot be segregated. For example, in the discussion that follows regarding balancing soft and hard approaches at the national level, this balance is sometimes achieved by using implementation policies on the softer side of the range while threatening harder compliance responses where those policies do not achieve results.

II. National Compliance Systems

A. The Role of National Systems

Human-induced greenhouse gas emissions and carbon sequestration are driven by public and private sector behavior that occurs within and across national boundaries. This broad, complex array of economic and social conduct is, in many ways, beyond the practical reach of international law or international institutions. Thus, unlike agreements that promise arms control or compromise territorial disputes, climate change compliance does not rely principally on the behavior of the sovereign. Rather, the key to state climate change compliance (as with many multilateral environmental agreements) is how effectively the sovereign translates its duty to its citizens.

Once translated through national policies and measures, the obligations must be met within a domestic context. The role of states as regulators, more than merely regulated, is thus critical in achieving meaningful compliance with international climate change commitments. Through effective national compliance policies, states can assure that GHG emission goals are met, and in turn secure their own compliance with commitments of the Framework Convention and the Protocol.

This prominence of national systems has certain advantages. National governments acting within relevant economic, political, and legal contexts can take more targeted steps to address climate change concerns — even where some degree of international cooperation is beneficial. National compliance policies can be fit to national needs, consistent with legal tradition and cultural norms.

As a practical matter, states can also target specific behaviors more effectively than any international regime or institution. While the Framework Convention and Kyoto Protocol focus necessarily on environmental consequences (GHG emissions), national governments can deal more directly with the behavior that leads to these consequences. This focus on conduct provides a much more tangible target for national compliance efforts. States can choose policies and measures with which they are comfortable (and which they deem adequate to meet reduction commitments), and then act to ensure compliance with their choices at a domestic level.

It should be noted that this report does not address which domestic policies and measures (PAMs) should be implemented, but instead focuses on the need to assure compliance with those PAMs once they are established. The authors recognize that even perfect compliance with inadequate PAMs would not be meaningful, but the question of how Parties should best implement the Kyoto Protocol is beyond the scope of this report.

States exercising their sovereignty are also, by definition, more capable of claiming jurisdiction over relevant entities where necessary to compel attention to policy choices. Political theories abound about whether, how, and when states may compel or cajole each other into participating in a regime and keeping their promises once made. But the sovereign can act less on theory and more as a matter of regulatory right when it operates in its own domestic system. While modern national constitutions and charters almost always constrain the exercise of sovereign will (along with political, economic, and cultural factors), the state's prerogative within its boundaries is far better defined and far more capable of concrete application. In addition, concerns about territorial sovereignty that may hamper international verification procedures and limit the reach of international officials can be minimized when compliance efforts are undertaken in a national context under the rules of the prevailing legal system.

This does not deny that states must look to their own conduct to reduce GHG emissions. States influence GHG emission rates both by their policies as well as their practices. Depending on the degree to which states own or control key industries, the sovereign's behavior will be a greater or lesser component of a national implementation strategy, and therefore a greater or lesser target of compliance efforts. But even where enterprises are wholly or partly state-owned, the state itself is better positioned to promote compliance with environmental norms than are its neighbors.

At the root of any compliance system is the ability to secure a desired behavioral response from the regulatory target — either through compulsion or inducement. National governments may simply be better positioned to mete out the inevitable rewards and punishments of compliance policy because they are more likely to have clear jurisdiction over the enterprises whose behavior is at issue. Moreover, on a practical level, states can act domestically in a manner that is more politically palatable, and possibly more equitable, than an international treaty institution, no matter how well conceived or well managed that institution may be.

B. National Regulatory Styles

While most countries use tools that arguably fall at many points along the continuum described above, some tend to emphasize one end of the model over the other. This choice of reward and punishment — the decision to rely on the "carrot" or the "stick" to assure performance — is a political and philosophical decision that varies within and among states.

The U.S. federal regulatory style, for example, has been described as a harder, "command and control" model, characterized by the tendency to set numeric requirements for the regulated community and to punish those who fail to meet the targets through penalties and injunctive orders. Most environmental standards in the United States are set in a formal process of public notice and comment. While procedural safeguards assure that agencies take account of input, the process is not typically marked by dialog, nor could it be described as a deliberate partnership between regulator and regulated. This approach is also reflected in the nature of the standards issued — which tend to be numeric emissions regulations or technology mandates on set timetables, rather than emissions goals combined with more flexible, management-oriented requirements. It is evident as well in the nature of enforcement responses, which can be highly legalistic processes that result in escalating fines and penalties. Even record-keeping violations, under some regimes, can result in penalty assessments of up to $50,000 per day or imprisonment.[9]

It should be noted that this image of the U.S. approach is changing, and there is a trend toward greater consultation and flexibility in both rulemaking and enforcement. Indeed, the United States has pioneered some of the more innovative compliance models that rely on flexibility, innovation, and the marketplace. Yet the backbone of the U.S. compliance system remains essentially intact, even while flexibility is gaining ground as part of the core regulatory philosophy.

In Great Britain, by contrast, the government has developed a more collaborative model of relations between regulator and regulated. In a comparative study of national styles of regulation, David Vogel has described the model:

> [P]olicy makers in Britain work closely with the industries whose conduct they are responsible for supervising. They rely heavily on their expertise and advice, generally secure their consent before formulating changes in policies, and whenever possible rely on them to implement the rules and regulations that are then adopted.[10]

Vogel analyzed environmental performance under the U.S. and British models, and concluded that the results achieved, despite stylistic differences, were comparable.

In the Netherlands, a similar cooperative approach is taken. Under the 1989 National Environmental Policy Plan, the Dutch government identifies "industrial target policy groups," which represent branches of industry with common characteristics (metal finishing, food processing, etc.), and then negotiates with them to determine targets for emissions reductions. The reductions are committed to a quasi-contractual document called an "integrated environmental target" that is signed by government and industry representatives. Industry environmental targets are then incorporated in environmental licenses for individual facilities within target policy groups and become legally binding on facility operators.[11]

C. National Compliance Strategies

Although national regulatory styles vary widely, there are common compliance strategies that influence the success of national environmental policies. These strategies may, in turn, bear on the success of any national climate change strategy.

Balancing Soft and Hard Approaches

There is increasing interest in diversifying, even balancing, softer and harder approaches to environmental regulation. The trend is evident in the United States, where the traditional, more punitive approach was highlighted by U.S. Environmental Protection Agency (EPA) Assistant Administrator James Strock in a 1990 speech to an international enforcement conference. He cited "vigorous environmental enforcement" as a central U.S. concern,[12] and stressed "a common commitment to protect the public health and environment of our peoples, and to do so through vigorous adherence to environmental laws. Without enforcement, environmental laws would be little more than wish lists..."[13]

Less than a decade later, at a 1998 meeting of the same group, a new EPA Administrator, Carol Browner, also highlighted enforcement as a tool to meet environmental challenges — but she provided a new context that emphasized softer elements of compliance. "[The Administration] believes that we can meet all these [environmental] challenges if we keep a few principles in mind: building strong partnerships, finding common-sense, cost-effective strategies, ensuring a healthy economy and a healthy environment — and providing tough enforcement of our nation's environmental laws."[14]

This apparent shift in emphasis toward a more balanced approach is also evident in the agenda of the enforcement conferences at which Strock and Browner spoke. In 1990, the 20-country meeting was titled an "International Enforcement Workshop," with discussions and themes centered on regulatory policing activities. By 1998, representatives from more than 100 countries attended the meeting, by now referred to as the Fifth International Conference on Environmental Compliance and Enforcement, and featuring new sessions entitled "Compliance Assistance Programs and Information Outreach...," "Structuring Incentives for Private Sector Compliance," and "Source Self-Compliance Monitoring Requirements," as well as an entire theme entitled "Carrots and Sticks." The thematic expansion arguably reflects a philosophical shift among the compliance officers who plan, chair, and attend the meetings.

An increased emphasis on balance may be critical in climate change. The regulation of GHG-producing activities will have a potentially deep economic impact, which may be ameliorated by softer approaches, including incentives or market-based mechanisms.

Embracing more market-oriented compliance models may reduce concerns about the social and economic effects of climate change policy because they are potentially more cost-effective and because the burden of compliance may be distributed by the market or offset by gains. Furthermore, a pure command and control model that simply passes the burden of meeting international commitments to the private sector on a rigid timetable with threats of sanction may be less workable both economically and politically.

This balance can be achieved through implementation policies and measures, through compliance instruments, or a combination of the two. While this report focuses on the latter, it is important to bear in mind that enforcement programs are closely tied to the policies and measures with which compliance is sought. Often in achieving a balance, the line between implementation policy and enforcement mechanism is blurred. A government's overall compliance assurance strategy can integrate and combine policies and mechanisms as needed to achieve desired results. It should also be noted that the authors' use of the term "balance" does not imply any specific equivalency in the use of soft or hard approaches, but rather the need to achieve a sort of equilibrium appropriate to circumstances and priorities, where forces and influences balance each other.

One example of a balanced approach is the United States' Acid Rain Program, designed to reduce the amounts of sulfur dioxide (SO_2) and nitrous oxide (NO_x) emissions. It effectively combines

command and control regulations in the form of hard emissions caps (setting the number of allowances to be issued to reach emission goals) with softer approaches, allowing point sources to select their own abatement methods and to integrate a trading program. In the case of SO_2 emissions, regulatory targets can make reductions by using cleaner fuel or by switching energy production from dirtier units to cleaner units. Market-oriented allowance trading is a primary system for reducing SO_2.

While the program gives considerable flexibility to units to achieve the program reductions, they also impose sanctions for non-compliance. Participants must pay a penalty of $2,000 (adjusted for inflation) per excess ton of SO_2 emitted. Non-compliant units must also offset the excess emissions with allowances. If these allowances are not available, then the participant must provide a plan to the EPA that describes how it will cut back emissions. The program has achieved meaningful compliance through an effective balance of hard and soft methods. In 1996, all of the units that were covered by SO_2 regulations in the first phase of the Acid Rain Program successfully met and exceeded their emissions goals. Aggregate SO_2 emissions were 35 percent below the allowable level in 1990.[15]

Establishing a Regulatory Baseline

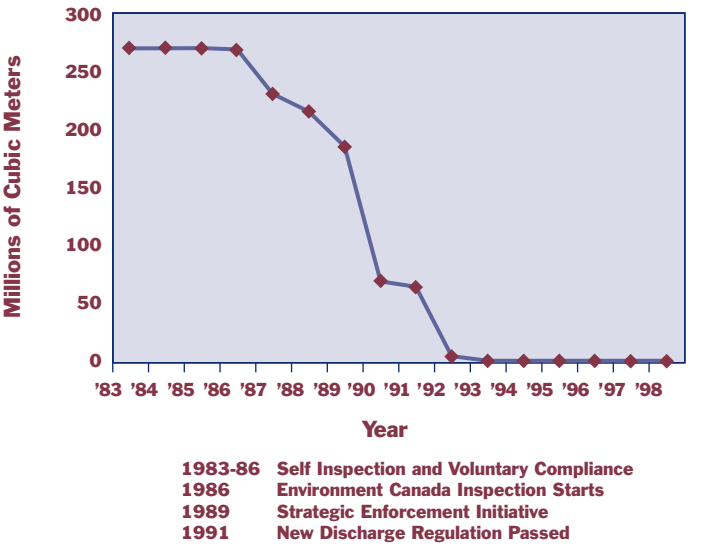
Efforts to balance compliance assurance strategies should not diminish the importance of minimum performance standards in national compliance programs. Baseline or minimum performance standards can serve as a floor below which the regulatory community is not permitted to go. Clearly established and enforced basic norms provide a baseline for performance against which voluntary programs can be measured, and from which more flexible, market-oriented programs can be promoted.

This principle is illustrated in the implementation of the Environmental Protection Act and Federal Fisheries Act by Environment Canada's western regional office. A 1999 report by the Acting Head of Inspections for Environment Canada's Pacific and Yukon Region traced the government's phased approach to implementing water discharge regulations in the wood preservation industry and found that self-inspection and voluntary compliance alone produced minimal compliance.[16] Between 1983 and 1986, Canada allowed voluntary implementation of a code of practice for the discharge of chlorophenates, whereby the mills was allowed to self-inspect. The decrease in toxic discharges during this period was "negligible." In a series of increasingly formal steps, Environment Canada strengthened its inspection protocol, instituted government inspections, and in 1989, began targeting the "worst offenders" in

a "Strategic Enforcement Initiative." In 1991, provincial and federal authorities cooperated to enact a regulation mandating specific operating practices and to implement a comprehensive inspection and sampling program. The results of these efforts showed a dramatic reduction in toxic discharges in the year following the new regulation, with a 99 percent drop in toxic discharges. (See Figure 2.)

Figure 2

Annual wastewater discharges from lumber facilities in British Columbia



Source: Environment Canada, Pacific and Yukon Regional Office data from Peter K. Krahn, 1998.

The importance of enforceable baseline performance standards in Canada was also highlighted in a 1996 KPMG Environmental Risk Management survey of many of Canada's largest companies, hospitals, universities, and school boards.[17] The survey revealed that the principal factors motivating environmental improvements were regulatory and that voluntary or market factors alone were less significant. The findings are outlined in Table 1.

These findings do not suggest that voluntary programs lack value. Rather, they suggest that softer approaches may supplement a baseline program of compliance inspection and enforcement.

Table 1

KPMG Environmental **Risk Management** Survey Results

Behavioral Driver	Percent Identifying Driver as Important
Compliance with Regulations	>90%
Board of Director Liability	>70%
Employees	>60%
Voluntary Programs	15% - 20%
Interests Groups	10% - 12%
Trade Considerations	<10%

Source: KPMG Environment Risk Management Survey from Peter K. Krahn, 1998.

Compliance Flexibility

Compliance flexibility allows the government to administer compliance mechanisms as appropriate (or the regulatory target to take approaches best suited to its capacity) to achieve maximum compliance. It can be promoted through a system that allows choice among soft and

hard approaches, or one that allows the imposition, granting, or withholding of rewards or sanctions as circumstances warrant.

The U.S. Acid Rain Program described above not only combines market and regulatory approaches, but also affords the regulatory target some flexibility in deciding how to meet goals by the most economically efficient path. Governments also have built flexibility into enforcement responses — again as a means to promote efficiency and maximize environmental benefits. A flexible enforcement response requires some innovation in design (which will tend to occur on a case-by-case basis), and it may include any of the following components:

- Compliance schedules granting additional time to meet requirements;
- Audit programs to confirm the causal root of compliance failures;
- Technical assistance that may be funded by the violator;
- Enhanced management plans, designed to minimize the possibility of future violations;
- Increased monitoring and reporting obligations;
- Technology investments, where the root cause of the violation can be addressed through upgrades or retrofitting; and
- Penalties in addition to "self-improvement" investments.

Special rules for medium and small enterprises may also be important to allow a flexible approach where individual enterprise emissions are relatively low (but cumulatively important). These rules can take the form of:

- *De minimis* exceptions that reduce or eliminate regulatory burdens on smaller companies (measured in terms of employees, annual profits, competitive position, etc.);
- Technical assistance programs, offering direct technical support or fiscal incentives to hire outside expertise;
- Burden-sharing programs, that promote efforts by small enterprises to pool resources, technology, or expertise to meet compliance mandates; and
- Financial assistance programs that provide grants, loans, or fiscal incentives to help meet compliance goals.

Although flexible rules can offer advantages, they may also produce drawbacks. Some governments may not choose flexibility where automatic penalties or response protocols are seen as more predictable or less burdensome to administer. In cases where violations follow a predictable pattern, and mitigating circumstances or defenses are likely to be inconsequential, a government may prefer a regime of automatic protocols and penalties. Some compliance issues may be so predictable that a "parking ticket" approach can be taken, wherein penalties are issued and paid with no judicial process and with little transaction cost to the government or the regulatory target. These procedures usually grant a right to a more in-depth process or appeal where special circumstances arise.

Another potential concern over enforcement flexibility is that it may raise perceptions of inequity where solutions are crafted separately for individual companies. There may also be a risk of real or perceived corruption where officials are in a position to reduce penalties at their discretion. These concerns can be countered by drawing clear guidelines within which compromises are structured, providing oversight through a committee or office responsible for managing compliance (but removed from direct negotiations), and assuring transparency both in the guidelines that will be followed and in publishing the results of compliance actions.

Non-Compliance Consequences

The consequences of non-compliance, sometimes referred to as the legal remedy or recourse, are an important tool at a national level because they establish the real cost that will be borne in cases of non-compliance. In the familiar metaphor of the "carrot and stick," consequences are the stick.

Consequences can be adjusted by national authorities to increase the economic or social burden of non-compliance, and thus serve as a type of incentive to comply. They can also take the form of reparation, abatement, or remediation requirements, and thus add inconvenience and a technical burden to non-compliance (and not coincidentally, ease or remove that burden from the government). Remedial orders also have the advantage of directly repairing or protecting the environment — a result that monetary penalties alone cannot always assure. Remedial efforts may also include required training for relevant personnel and mandated technology investments, where appropriate, as an addition to or substitute for monetary penalties.

A frequent goal in setting an appropriate consequence is to promote equity and a "level playing field" within the regulated community — assuring that those enterprises complying with the law are not put at a competitive disadvantage to those who fail or refuse to comply. This goal can be met by adjusting penalty payments to remove any possible economic benefit gained from non-compliance (e.g., the avoided cost of technology or process changes).

Equity may also favor a graduated scale, where unintentional conduct is punished less severely than intentional actions. Repeat offenders, or those acting in reckless disregard of applicable norms, may be punished more severely. Consequences may also include penalties to serve as punishment or deterrence of future non-compliance, either by the party at issue or others subject to the same rules. These objectives are sometimes achieved in environmental cases by imprisoning individuals where evidence shows that they are personally culpable and the violation is egregious.

Penalty Allocation

In instances where national compliance systems provide for fines and penalties, some attention should be paid to how those penalties are applied. Often, they are simply treated as a source of revenue and devolve into a national treasury for general purposes. Those resources are no longer available to the violator to improve environmental performance, nor to the relevant government agencies to finance remedial efforts or continued environmental vigilance. Certainly, a system that maximizes the total resources available for environmental performance — in the hands of the government or the private sector — should be viewed as a compliance advantage. Moreover, where medium or small enterprises are regulatory targets, or where important sectors may need special consideration,[18] the argument for careful resource allocation is strengthened. Where GHG emission reduction is the ultimate objective, resources should be maximized to achieve that objective in cases where specific regulatory targets cannot afford to both pay penalties and apply resources to modify their processes or technologies to obtain desired results.

A compliance system that applies penalty resources to abatement, remedial action, or environmental improvements at the facility level (including management improvements) will serve that objective more directly. This does not suggest that otherwise-appropriate penalties should be reduced — certainly not where reallocation may encourage a greater incidence of non-compliant behavior. Rather, it merely

suggests that penalties may be redirected to serve the ends of the compliance program from which they arose where circumstances warrant.

Voluntary Compliance

At the Fourth International Conference on Environmental Compliance and Enforcement, in a workshop entitled "Promoting Voluntary Compliance," one of the participants, a senior environmental officer at a major international company (and one of only a handful of private sector representatives present), opened the discussion with the statement that "[t]here is really no such thing as voluntary compliance."[19] The speaker explained that, if one is bound to comply, "by definition it isn't voluntary." There was a brief silence, followed by general agreement.

But there was also a general understanding that voluntary compliance can be interpreted to mean compliance with non-compulsory "guidelines," or the implementation of enforceable mandates without the need for direct government intervention — and there was agreement that systems should be designed to promote this outcome. For example, many income tax systems, while compulsory, rely on taxpayers or employers to collect and send payments, and require taxpayers to file periodic reports on amounts still owed or due in refund. The systems are voluntary in that regulatory targets manage their own compliance by design (directly or by proxy). The government intervenes only to monitor or to investigate instances of suspected mis-reporting or fraud. The point of promoting voluntary compliance through systems such as this is to minimize government intervention and its attendant transaction costs.

The Fourth International Enforcement and Compliance workshop participants identified six factors that drive voluntary compliance:

1. Public opinion;
2. Global competitiveness;
3. Enforcement [as a deterrent];
4. Self-motivation and awareness;
5. Internal accounting systems capable of calculating the real costs of poor performance; and
6. Requirements of suppliers and buyers.[20]

Each of these factors might come into play as a means to promote national GHG emissions reductions through voluntary compliance systems. Because of the technical challenges to performance measurement, the breadth of human and industrial activities that drive GHG emissions, and the need to promote long-term, internalized behavior change, such voluntary programs may bring significant benefits.

Voluntary programs may in some cases challenge the regulated community to adopt non-compulsory guidelines or achieve performance that exceeds government mandates, and governments may play an active role in promoting these programs. The motivation for this additional effort may be economic savings realized through management, process, or technological efficiency (at the root of many clean production programs), or competitive advantage gained by public perception of good corporate "citizenship," (implicit in some "green label" systems), or both (as with environmental management systems such as ISO 14000). In other cases, there may be an implicit or explicit threat that more draconian measures will follow where self-imposed programs fail to achieve positive results.

Whatever the motivation, non-regulatory programs should do more than create a public relations façade that consumers and competitors will soon see through. An informal industry-NGO group in Canada, the "New Directions Group," has developed a set of criteria and principles to promote the adoption and implementation of these "Voluntary and Non-Regulatory Initiatives" that emphasizes measurable performance-based objectives and clarity regarding possible rewards and consequences.[21] This emphasis was also a key factor for success identified in a 1999 Organisation for Economic Co-operation and Development (OECD) study on "Voluntary Approaches for Environmental Policy."[22]

Self-Assessment and Reporting

Compliance regimes that rely upon regulatory targets to monitor and report their own performance are common in many countries. This approach allows for the collection of compliance data without employing an army of technically trained officials to conduct regular, invasive inspections, and helps reduce monitoring costs through internal (and potentially more efficient) programs. It also encourages the regulated community to build a level of self-awareness that promotes preventive action and encourages voluntary compliance. Reporting often includes regular accounting of operational data and may include notice of irregularities or violations. Governments rely on data review and periodic inspections to promote reporting accuracy.

Mexico implemented a self-monitoring and reporting program in 1995 described by one official as "the most important voluntary tool in [Mexico's] National Environmental Policy."[23] Under the auditing program, from June 1992 to June 1998, 970 public and private facilities conducted environmental audits, including some of the largest companies in Mexico: Petróleos Mexicanos (PEMEX), Federal Electricity Commission, National Railroads of Mexico, Nestlé Co., Ford Motor Co., General Motors, and Grupo Cementos Mexicanos. Through June 1998, 487 companies had signed action plans to implement recommended environmental improvements — in some cases going beyond the steps necessary for formal compliance. Mexico's head of environmental auditing reported in 1999 that these action plans cost an aggregate of approximately US$1.96 billion, largely to modify production processes and install environmental technology. These investments were made under a program that cost the government a relatively small sum of about US$20 million to administer — a private-public investment ratio of roughly 94:1.[24]

National climate change regimes would certainly benefit from these self-reporting mechanisms. The critical success factor will be to design reporting systems that encourage the regulated community to go beyond merely aggregating and passing on data. Where possible, regulatory targets should be encouraged to undertake periodic, in-depth GHG audits to identify management and process weaknesses, inefficiencies, and opportunities for improvement. Of course, there may be some reluctance to engage in this type of exhaustive internal review if it may uncover violations or potential liability that would otherwise remain unnoticed. (See Box 1.) Most in the regulated community, however, will recognize the value of uncovering systemic problems — particularly if the overall compliance regime is designed to encourage and support positive change rather than punish mistakes. Governments might further encourage self-reporting through access to compliance support programs, including technical cooperation funds, where companies report problems and propose solutions.

Box 1

Voluntary Auditing and Reporting Privilege

Where voluntary auditing may reveal compliance violations, there is an understandable reluctance to uncover, much less report, the underlying facts. In some legal systems, *known* violations (those that have been discovered by a regulatory target) must be reported, and *knowing* violations (those that are intentional) are more heavily sanctioned than cases of mere negligence, whether self-reported or not. This can further reduce the desire to self-audit. Ignorance may be rewarded because the law may look more favorably on "innocent" mistakes of which operators were unaware.

One solution might be to define "innocent" errors to exclude cases where reasonable self-audit procedures would have uncovered a problem. Many laws are designed to increase sanctions where a violator "knew or *should have* known" of conditions that led to the violation.

Another approach is to create a voluntary auditing or reporting privilege. This approach encourages internal audits and transparent reporting by creating incentives for self-identified, -reported, and -corrected problems. These incentives could include reduced fines or penalties, grace periods to correct problems uncovered through audits, technical assistance programs, or other regulatory relief.

Institutional Competence and Coordination

The effectiveness of climate change compliance regimes at a national level will depend in great part on the nature and effectiveness of the institutions that shape, manage, and implement policies. Compliance institution functions vary from education, training, and technical support to evaluative and punitive responsibilities (See Table 2), and one issue that must be addressed is whether to house these functions in the same institution or separate ones. Many governments have found that segregating compliance functions facilitates better oversight, allows for more targeted training, and clearly defines institutional missions. Separating supportive and punitive compliance functions, for example, may be desirable since an institution that functions well in facilitating or offering cooperation may not be well suited to act as referee or arbiter in a dispute that requires some level of due process.[25] On the other hand, there may be an advantage to combining responsibilities in a single agency to assure consistency in program design and application, or to create a coordinating commission that may serve a similar function.

A middle ground might be found in a hybrid approach — creating a single agency that can assure consistency and coordination, while clearly separating supportive and dispute resolution functions within that agency. It would be critical to distinguish the two roles carefully, however, to assure autonomy and fairness in the branch charged with adjudicative and remedial functions.

Table 2

Compliance Institution Functions

Function	Model	Description
Policy-Making	Trigger	Compliance considerations must be taken into account in policy formulation to assure that rules can be met, measured, and enforced.
Awareness Building	Supportive	Awareness building is critical to educate potential regulatory targets and other interested Parties, and maximize compliance.
Training and Education	Supportive	Efforts to make regulatory targets, and the broader community, aware of applicable norms can increase voluntary compliance.
Technical Support	Supportive	Technical support to regulatory targets can serve to maximize compliance and may be particularly important to enterprises that lack internal expertise.
Research and Study	Supportive	Compliance institutions should continue to build their own expertise even as they offer support to the regulatory community.
Monitoring and Inspection	Trigger	These core compliance assurance activities include record reviews, interviews, on-site inspections, and feedback.
Remedial Support	Supportive	Technical compliance support keyed to specific industries, companies, or facilities where non-compliance has occurred, or is likely to occur, will minimize failures.
Remedial Order	Punitive	Where compliance failures are identified, a targeted response may be required of the company or facility in violation. This may be accompanied by additional supportive or punitive actions.
Prosecution	Punitive	Building and presenting a legal case where a violation has occurred that is not appropriately managed through supportive or remedial measures.
Adjudication	Punitive	The process of examining evidence, making determinations of non-compliance and ordering appropriate penalties, sanctions, or other relief.
Penal	Punitive	Where sanction or penalty has been ordered, compliance institutions must execute that order by collecting penalties, monitoring remedial efforts, or other relief.
Program Evaluation	Trigger	Compliance institutions should have the capacity to evaluate their programs at every level internally (albeit transparently), with some degree of independence.

In terms of the continuum of soft to hard approaches (See Figure 1), the functions described in Table 2 above tend to be either punitive or supportive, although some functions act as triggers for further action — which can follow either model.

However a government decides to divide responsibilities, it is critical that institutional jurisdiction, or "competence," be defined carefully to assure that responsibilities are met by capable institutions. Inconsistent jurisdictional lines and uncoordinated institutional responses can diminish the effectiveness of compliance and enforcement programs. In Germany, for example, a 1996 study on the state of environmental law effectiveness by Gertrude Lubbe-Wolff found "[e]nforcement deficits... particularly in areas where administrative agencies take actions on their own initiative (monitoring, supervision, inspection)."[26] In the area of climate change, where implementation policies may range across a number of sectors and institutions, coordination may be especially critical.

Civil Society Participation

Civil society participation is an increasingly recognized element of a meaningful compliance regime.[27] At the time the Framework Convention was signed, participants in the UN Conference on Environment and Development also signed a declaration that affirmed the importance of public access to information, policy-making processes, and judicial processes.[28] Since then, governments have taken steps to engage citizens in the design and implementation of environmental norms — and to help promote compliance assurance — on an increasing basis.[29]

The key is to engage civil society in a useful and meaningful manner. Table 3 outlines some of the ways in which the public might be integrated. All of these approaches have been put into practice by governments with some success in contexts that might be relevant for climate change.[30] Transparency is promoted in the United States, for example, under the Clean Air Act, through the availability of public records relating to regulations, implementation plans, and violations,[31] and through public notice of proposed enforcement settlements.[32] Citizens are also given the right to monitor and enforce standards in some circumstances, by acting as "private attorneys general" under the U.S. Clean Water Act. Citizens may bring claims in federal courts under the Act:

> (1) against any person...who is alleged to be in violation of (A) an effluent standard or limitation under [the law] or (B) an order issued by the [EPA] Administrator or a State with respect to such standard or limitation, or
>
> (2) against the [EPA] Administrator where there is alleged a failure of the Administrator to perform any act or duty under this chapter which is not discretionary with the Administrator.[33]

While these provisions are subject to procedures and limitations that preserve the government's primary role in enforcement, they have proven to be a powerful tool for integrating citizens into the compliance process.

Of course, the United States is not alone in its use of legal tools to integrate citizens into environmental compliance processes. Mechanisms in other countries (both Annex I and non-Annex I Parties) range from public access to compliance records and administrative hearings to constitutional actions in instances where environmental rights are sufficiently threatened.

Table 3

Public Participation in Climate Change Policy Formulation and Implementation

Participation Type	Climate Change Relevance
Awareness/Transparency	Public awareness can increase compliance through greater understanding of applicable norms, and can be promoted through media campaigns, open meetings, and making compliance-relevant documents available where possible.
Policy-Making	The process of policy design can benefit in many cases from citizen input, including through public hearings, notice and comment rulemaking, open meetings, and other consultative processes.
Monitoring and Verification	Citizen monitoring can increase efficiencies by reducing burden on governments otherwise charged with data collecting, and can include rules that specifically grant citizens standing to participate in certain proceedings, or allow the introduction in evidence of data gathered by non-governmental sources.
Citizen Suits	Citizens may be given the right to seek relief for environmental threats or injuries, either on their own behalf or acting in the broader public interest. They may also complement the role of government as prosecutor in some cases, under systems that allow citizen groups to file administrative or judicial complaints for violations of environmental laws.

Many of these legal mechanisms are directly promoted in the 1998 European Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention), and the 1999 Inter-American Strategy for the Promotion of Public Participation in Decision-making for Sustainable Development.[34]

Expanding Traditional Regulatory Targets

Climate change compliance is complicated by the fact that the behavior that drives climate change is individual as well as institutional. In some cases, climate policies may target individuals as consumers (through, for example, product preferences), or individuals as decision-makers who elect where to live, how to commute, and whether to recycle, among other things.

Governments that take this policy road may face difficult questions about how to promote compliance at such a broad level. One approach may be to integrate sub-national governments into compliance efforts where appropriate. A number of countries already devolve to local or provincial governments the authority to manage environmental compliance even where goals and standards are set nationally. While the regulatory targets in these cases tend to be institutional, decentralized compliance authority may be adaptable to policies that target individual compliance.

III. Monitoring and Verification

National compliance with climate change commitments, as with any international commitment, must be verifiable to assure credibility – and accurate and timely data form the core of any verification system. An effective oversight system will help assure that emissions reduction commitments are being embraced nationally, and thus promote meaningful compliance. Yet GHG emissions cannot be directly measured on the scale necessary to monitor compliance with a global system. Carbon emitted and sequestered must be estimated, largely indirectly, by proxy.[35]

The Kyoto Protocol establishes a framework for emissions estimation and data reporting, under Articles 5, 7, and 8.[36] This estimation and reporting process is central to confirming compliance with Kyoto commitments and to identifying instances where Parties may need to take responsive action. Because the Protocol calls for Parties to incorporate the "necessary supplemental information" to ensure compliance, the process can also support efforts to cure domestic compliance failures and adjust implementation strategies where needed.[37]

To meet these objectives, the reports must be as accurate as possible despite the technical limitations of data collection and measurement. The reports will be crucial not only in confirming that Parties have effectively translated their commitments to the domestic level, but also in assuring the credibility of trading programs, setting realistic targets for future commitment periods, and designing strategies for moving beyond the Protocol to future international agreements on climate change.

A. Challenges to Effective Monitoring and Verification

Monitoring and verifying compliance with climate change commitments will be uniquely challenging. As described above, the fact that emissions will be estimated and not directly measured is the most critical challenge. A further complication is that implementation strategies will vary greatly, requiring a range of estimation techniques that will need to be comparable to assure equity. Article 5 of the Protocol calls for national estimation systems using

"agreed" estimation methods. But Parties may use other methodologies, subject to adjustments which themselves must be made according to "agreed methodologies." Given the range of implementation options and the technical complexity of estimating the GHG values of these options, it is difficult to imagine that an equitable comparison of national implementation approaches will be a simple arithmetic exercise.

In addition, climate change policies will largely be implemented domestically and will therefore need to be measured for success within national borders. Even where GHG reduction credits are traded internationally under the Kyoto Mechanisms, the underlying value of those credits may be influenced by domestic action. Thus, the credits may themselves be readily tracked, but the underlying value of the credits may defy easy monitoring.

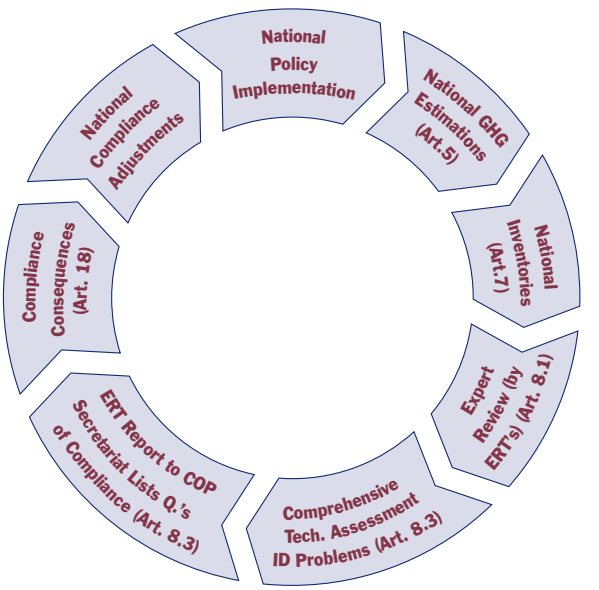
In other international agreements, such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES),[38] direct observation and measurement can occur at a point where borders are crossed. But the "commodities" traded under the Protocol will be principally intangible rights and credits. Even the most tangible commodity that will be subject to trading, property set aside for carbon sequestration, will by definition never cross a border. Instead, emissions credits will be assigned to the property under Articles 3.3 or 3.4 of the Kyoto Protocol, based on its estimated value as a carbon stock, and those credits will be traded. Thus, apart from the technical challenges of emissions estimation, the intangible nature of the commodities traded may defy straightforward approaches to data collection and verification.

Finally, all GHG reporting must pass through a process of expert review designed to provide oversight of Kyoto Protocol performance by Parties. (See Figure 3.)

The procedural complexities of this process, coupled with the technical complexity of emissions

Figure 3

Overview Kyoto Protocol **Compliance and Reporting Process**



estimation, will complicate timely compliance verification. During a Climate Change Secretariat compliance workshop, the Secretariat provided a draft outline of the reporting and review process that showed the process of verifying compliance with the Protocol taking as long as fifteen months after receipt of country reports.[39] Verification may be further delayed because compliance information is to be submitted annually for each year of the commitment period as part of national communications under the Framework Convention, and these submissions will take time to compile.[40]

B. Principles and Strategies for Effective Monitoring and Verification

International agreements employ a range of monitoring and verification strategies tailored to the nature of commitments embraced within the agreement, the technical elements of the behavior or results being monitored, and the willingness of the parties to accept the varying levels of intrusion that monitoring often requires. (See Table 4.) A review of environmental and related agreements shows that the most common monitoring strategy relies on data collection and reporting by the parties themselves, and on cooperative mechanisms for verification.

Table 4

Strategic Approaches to **Monitoring and Verification**

Approach	Description
Report-based	Compliance-relevant data is reported by parties periodically, often in an agreed format. Some joint or independent review may follow. This approach is envisioned in the Kyoto Protocol, Art. 7.
Notice-based	Parties are required to give notice of actions taken under the agreement or compliance failures. Such notice may be in addition to regular reporting obligations. For example, in the Basel Convention on the Control of Transboundary Movements of Hazardous Waste and Their Disposal (1989) (Art. 4 and 6), parties give notice of proposed waste transfers so they may be better tracked by receiving states.
Observation-based	Parties (or non-parties) may directly observe the compliance behavior of signatories and report instances of alleged violation. The Convention on the Prohibition of Military or any Other Hostile Use of the Environmental Modification Techniques (ENMOD) (1976) Art. V, relies on this mechanism where, as a practical matter, self-reporting is unlikely to occur.
Citizen-based	This approach is similar to observation-based monitoring, but citizens are enabled to notify the relevant tribunal of alleged non-compliance. For example, the North American Free Trade Agreement, Environmental Side Agreement (1994) Art. 15, allows citizen groups from member states to submit concerns about certain compliance issues that the parties are unlikely to self-report.
Trace-based	Where there is a tangible object of the agreement, compliance is monitored through a registration and accounting system that allows the object to be traced. The Convention on the International Trade in Endangered Species, for example, requires permits to be issued that accompany the species being traded as a means to verify that their trade is lawful.
Cooperation-based	This approach relies on mechanisms of cooperation and coordination (usually vaguely-defined) to assure the mutual exchange of information, including implicitly the monitoring of agreement compliance.[41] Cooperation is a key feature of the Kyoto Protocol. Although not necessarily tied to compliance monitoring, it could serve that purpose.

In the case of the Kyoto Protocol, effective monitoring and verification can benefit substantially by adherence to several key principles and strategies: international cooperation, integration, transparency and openness, independent study and verification, redundancy, and consequence-based deterrence. The Kyoto Protocol embraces many of these ideas, and the negotiating group on Articles 5, 7, and 8 has integrated them further into the monitoring and verification system. But the manner of execution is critical and should itself be monitored to promote the long-term success and credibility of the Kyoto Protocol's monitoring and verification process.

International and Regional Cooperation

The Framework Convention and the Kyoto Protocol, consistent with many multilateral environmental agreements, generally rely upon cooperation and self-reporting as monitoring mechanisms, with verification under the Protocol the subject of expert review under Article 8. (See Appendix A.) At some level, this emphasis on cooperation can be seen as a verification tool. Joint research, information exchange, data gathering, and even scientific conferences may be a vital means of monitoring and verifying performance. This type of cooperation puts experts in touch on an informal and real-time basis, where concerns about data collection and accuracy, as well as methodologies and interpretations, are difficult to hide.

Regional efforts to combat marine pollution in the Mediterranean provide an example of a cooperation-based system that may be relevant for climate change. While some sources of marine pollution can be monitored effectively, there are more subtle influences, such as land-based sources, that emanate from a range of conduct within national territories but have an impact outside the border. As with climate change, the consequences of these types of marine pollution are more easily measured than the conduct that caused them.

To address this challenge, the regional Convention for the Protection of the Mediterranean Sea Against Pollution relies heavily on a cooperative approach.[42] The Mediterranean Convention created "complementary or joint programmes…for pollution monitoring" in the Mediterranean, and called for parties to designate "competent authorities for pollution monitoring within their national jurisdiction." This focus on monitoring both the sources and end-point of the pollution recognized the importance of monitoring cause and not just effect. The Mediterranean Sea Convention also called for direct scientific and technical cooperation, as well as cooperation "in the formulation and adoption of appropriate procedures

for the determination of liability…" resulting from violations of the Convention.[43] These approaches, in combination, have promoted the success of the Convention. While more still needs to be done, efforts to reverse the damage to the Mediterranean Sea have led to some notable progress,[44] and the cooperative mechanisms established under the Convention have likely played a part.

Cooperative compliance monitoring is also a hallmark of the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal,[45] which calls upon parties to transmit specific information on waste transfers, disposal, and accidents, as well as to exchange aggregate statistical information relevant to compliance with the Convention. While the Basel Convention deals with wastes that may be more discretely monitored than GHG emissions, some of its provisions may be used as models for implementing the trading aspects of the Protocol, where discrete units will be defined and transferred. For example, Basel requires that waste shipments be documented and that notice be provided from exporting states to the intended destination.[46] This process, coupled with annual reports, provides a clear record of transfers that could serve as a model for the record-keeping procedures that will be necessary under the Kyoto Mechanisms.

National System Integration

The application of national data to verify compliance is a central feature of the Kyoto Protocol. The primary source of compliance data will be annual inventories and national communications under Article 7. Assigned emissions reduction amounts will be tracked for purposes of trading programs through the use of national registries to be developed on the basis of these data. Thus, the successful integration of national institutions and methodologies into the international monitoring and verification process is critical. National compliance monitoring systems can be deliberately designed to meet international reporting protocols, thereby avoiding duplication and promoting efficiency and accuracy.

The Basel Convention, discussed above, provides an example of integrated national and international compliance monitoring. Under Basel, a competent authority is designated by each party as a focal point to receive notification of a hazardous waste transfer. This same authority may be granted jurisdiction over the management or disposal of the waste within the national territory, and can more readily track and confirm disposition. The authority is thus in a position to offer or request technical assistance regarding compliance, or to transmit the results of relevant experiences, technical progress, or new findings

at the national level to international counterparts. Ultimately, this authority provides to the secretariat annual reports that detail transfers of waste and a range of other compliance-relevant issues.[47] Again, this approach is consistent with the requirements of the Kyoto Protocol, and some of the experience gained implementing Basel may prove relevant.

Direct Inspections and Monitoring

There may be cases in which direct on-site or in-country verification by an international team will be considered appropriate, as a type of spot-check to promote reporting accuracy where a party seeks technical assistance, or where non-compliance has been reported or is suspected. Because of the technical complexity of verification issues, and concerns about national sovereignty, systems designed under arms control agreements may provide guidance in these circumstances. One such agreement, the Comprehensive Nuclear Test Ban Treaty, has an extensive system of international monitoring. It includes sophisticated technologies that allow direct "observation" from remote locations outside national territory, consultation and clarification, as well as on-site inspections and "confidence-building measures."[48] On-site inspections by pre-approved experts are subject to prerequisites of notice, consultation, and clarification. They are also strictly limited to confirming or denying whether test explosions have occurred, and are to be conducted in the "least intrusive means possible."

Similarly, the Landmine Convention allows "fact-finding missions" in the territory of a signatory, as a means to "clarify and seek to resolve questions relating to compliance" that may be raised by other signatories.[49] There are similar protections for parties whose territory is being visited by a fact-finding team, including the right to object to any individual's membership on the team (again drawn from a pre-approved list of experts).

These agreements may be adapted as models for climate change verification in some circumstances, although the verification of emissions estimations does not lend itself in most cases to the inspection of facilities or other tangible targets. Where records, data, and relevant tangible assets are widely diffuse, the cost of such an approach (including the cost of maintaining and dispatching trained inspection personnel, along with the transaction costs to the Party subject to inspection) could be prohibitive. That, coupled with its implications for a system largely built on cooperation and good faith, suggest it should be used as a supplement and not a principal strategy.

Transparency and Openness

Compliance verification may be promoted by making compliance data publicly available on a routine basis at a national level. While this may be complemented by mechanisms developed for international observers or participants, domestic organizations can play a more direct role in monitoring and verification on a routine basis. This will not only facilitate compliance assessment by Parties, but also allow independent verification by interested international and non-governmental organizations, where appropriate. Such public reporting systems have provided benefits in the past, at both national and international levels, by providing political attention necessary to correct problems, or as a basis for informed consumer choices favoring countries and entities with strong compliance records. In the mid-1990s, for example, Indonesia's Environmental Impact and Management Agency (BAPEDAL) established a color rating system called the Program for Pollution Control Evaluation and Rating (PROPER) that translated environmental compliance into a series of color codes designed to set companies with strong compliance records apart from those consistently falling behind. BAPEDAL assigned and publicized color codes on the basis of self-reported industrial compliance data. The publicity surrounding these designations was credited with driving poor performers to compliance without the threat of additional government sanction.[50]

Another example can be found in an instrument used in the World Trade Organization (WTO) to monitor members' commercial policies, whereby every two years WTO staff members carry out a "trade policy review" and release it after consultations with the government.[51] A similar instrument is used by the International Monetary Fund (IMF) to monitor members' policies, in the form of what are known as "Article IV consultations," the results of which are now released to the public with authorization from the government.[52]

In some cases, Parties may also consider opening deliberative or adjudicative processes to citizen input. Citizen groups could be allowed to provide independent data or express concern about specific compliance questions. An example of the latter is the NAFTA citizen submission process, described in Box 2. Although the Protocol does not specifically create such a process for compliance purposes,[53] Parties could adapt the model on a regional basis, either formally or informally, or it could be considered as a possible future supplement to the Protocol. The NAFTA citizen submission process was itself created in a side agreement, and experience with the process to date suggests that it has been relatively effective as a non-adversarial means to highlight and address domestic enforcement concerns.

Transparency may also be achieved through coordinating bodies formed on a sub-regional basis that can oversee verification efforts and offer technical assistance. This could include regional economic

Box 2

Citizens as International Monitors — the NAFTA Model

A successful model of citizen integration is found in the North American Free Trade Agreement (NAFTA), where the trading partners established a citizen submission process to address concerns over domestic environmental enforcement. Under the submission process, citizen groups from any of the parties may make a submission to the North American Commission on Environmental Cooperation (CEC) alleging that a party is failing to enforce effectively its environmental laws.[54] The CEC Secretariat is empowered to investigate submissions and make reports to the Commissioners with findings and recommendations for further action. There are procedural safeguards for the NAFTA parties, in that submissions cannot be considered where a controversy is already the subject of administrative or judicial action in the relevant country (these actions can even be commenced after a claim is filed to stop further external scrutiny). While the process lacks "teeth" in that any real follow-up is left to the discretion of the party that allegedly failed in enforcement, it exposes otherwise internal enforcement concerns to the light of an international forum, and brings substantial publicity and pressure to bear on problems.[55]

integration organizations, such as the European Union, that will seek to meet commitments collectively, or regional cooperative bodies formed for purposes that may be consistent with promoting climate change compliance, such as the NAFTA Commission on Environmental Cooperation or the Association of South East Asian Nations (ASEAN). It could also include any group of Parties that will be jointly using the Kyoto Mechanisms. These bodies can provide peer review within a regional context that may be more efficient, and perhaps less threatening, than relying solely on an international system.[56]

Independent Study and Verification

Compliance verification can also be advanced through "literature reviews" of independent data sets compiled by independent, credible sources. The Protocol contemplates expert review committees to examine annual submissions, and these committees could use relevant data in key sectors to verify underlying elements of national reports.

As a 1998 OECD Information Paper on climate change compliance pointed out, "[I]t is unlikely that technical verification of the final estimates would be feasible, but it is possible to include verification of main assumptions through corroboration with independent sources of information."[57] The OECD Paper identifies organizations such as the International Energy Agency, the United Nations, Eurostat (the Statistical Office of the European Communities), the Economic Commission for Europe, and the Food and Agriculture Organization, as well as local or regional organizations and the OECD itself as relevant sources of independent statistics. To this list could be added a range of non-governmental organizations that gather and maintain credible and reliable data.

Where these data are comparable to those reported in annual reports (or can serve as proxies or collateral indicators of data reported in annual reviews), compliance can be independently checked. At the least, the noting of clear inconsistencies may lead to further scrutiny or adjustments.

Redundancy

Wherever possible, data should be collected from different sources, and through complementary institutions, as a safeguard to assure accuracy. This could include data provided directly by Parties, or through non-governmental or independent sources. An example of this can be found in the compliance provisions of the Marine Pollution Prevention Convention (MARPOL 73/78), which permit the collection of compliance data regarding the waste disposal practices of ships by the flag state (where a ship is registered) as well as port states or coastal states where a ship may harbor or transit.[58] Because compliance with waste disposal provisions of MARPOL must largely be monitored indirectly, the redundant inspection rights that permit any competent authority to review equipment and waste disposal logs are essential.

Redundancy raises the prospect of conflicting jurisdiction and inefficiency, but multiple verification systems do not necessarily breed confusion and inconsistency. Where systems provide jurisdictional clarity and promote harmony in reporting obligations and formats, conflict can be avoided and multiple data sources and institutions can work in tandem to produce more certain results.

Consequence-Based Deterrence

Many national compliance systems that require regulatory targets to report on their own performance also impose penalties for false reporting. Although some distinction can be made between deliberately misleading and honest mistakes, the onus to collect and report accurate data, and to identify failings, often falls on the party bound to comply.

False reporting can also be actively discouraged at the international level to help assure the integrity of the monitoring and verification system. Where a supportive system is created, deterrents might include measures that would suspend financial support or compliance extensions, and could also affect ability to use the Kyoto Mechanisms. While some would argue that these measures should not be withheld from those who are falling behind, it may be more appropriate to reserve limited resources and privileges for those who are willing to admit their dilemma, rather than hide it. This would affirmatively promote accuracy in reporting, and allow compliance problems to be more easily addressed and corrected. In addition, once a problem is identified, future efforts to hide or manipulate data would be more difficult.

IV. Participation

While the extent of national participation in an international agreement is not typically identified as a compliance issue, a strong argument can be made that meaningful compliance with global climate change commitments can only be achieved where there is broad participation by the Parties. This is particularly true of the Kyoto Protocol Annex B commitments, where success is defined as an aggregate average of emissions reductions. The Protocol, almost by definition, cannot be effective if only a handful of states accept and observe its conditions.

Political theorists have recognized that the failure of states to cooperate through international agreement — termed "defection" from an accord — can result from a failure to comply or a failure to participate. In a 1996 article, George Downs and his colleagues analyzed causes for state defection from international agreements that are equally applicable to non-compliance and non-participation.[59] In essence, the same factors that might lead a state to breach its international obligations may also lead it to avoid those obligations in the first place.

More recently, Scott Barrett advanced a theory of international cooperation arguing that non-compliance and non-participation, while distinct, "are related problems and should be analyzed jointly." [60] Barrett's argument may have particularly currency in the climate change context, where states are deciding whether to accede to the Kyoto Protocol even as they design its compliance regime. In the midst of this process, his advice seems apt:

> [W]hile countries might be compelled...to comply with the agreements they sign up to, there does not exist an international norm that requires that states *be* signatories to a cooperative agreement. Indeed, the essence of sovereignty is that states are free to participate in treaties or not as they please.[61]

Participants in the design of the Protocol's compliance regime may be served by attention to this principle. The compliance framework can influence not only decisions to comply, but also decisions to participate in the Protocol.

A. The Importance of Participation

Broad participation may not be critical to all international accords, and much depends on the nature and objective of the agreement. The UN Convention on the Law of the Sea (UNCLOS) and the Convention on Biological Diversity,[63] for example, have seen progress despite the notable failure of some countries, including the United States, to ratify.

But progress has been partial under these agreements — and largely based on factors that may not be relevant in the context of climate change. One of those factors, for example, is the tendency of non-participants, including the United States, to embrace many important elements of the agreements outside the strictures of the accord (either through national law or as a matter of international custom). This may be seen as *de facto*, if not *de jure* participation — and both are of considerable importance in international law, where custom and practice are often defining elements of the law. Yet the critical component of the Protocol, a national commitment to specific GHG emissions reductions, is less susceptible to coincidental policy or *de facto* adoption or performance. The Kyoto Protocol is itself evidence of this as its framers placed a strong emphasis on cooperation, mutual effort, and trading systems that will increase the efficacy and minimize the cost of the deliberate steps that must be taken to reduce GHG emissions.

The Biodiversity Convention and UNCLOS also differ in addressing concerns that, while global in nature, are amenable to measurable progress at a local or regional level. The Biodiversity Convention, for example, has led to national inventories of biological resources, national species, and habitat protection programs, and considerable international investment in national planning and conservation through, for example, the Global Environment Facility.[64] Similarly, UNCLOS has helped define maritime boundaries for signatories, and has led to the negotiation of an agreement relating to conservation and management of highly migratory and straddling fish stocks[65] — a concern that can be crucial in some regional fisheries.

The Kyoto Protocol, however, goes beyond partial or regional solutions, and while Annex B reduction commitments among Parties do vary, they were negotiated to achieve an aggregate overall goal. Unlike environmental concerns where local action can improve local conditions, climate change impacts are global but brought on by local practice.[66] Europe, for example, could not forge ahead separately, and hope to claim victory in protecting its "own" climate.

Thus, broad participation in climate change commitments is critical in large part because of the nature of the problem. If participation is lacking, a smaller group of states would be forced to shoulder additional reductions or abandon their larger goal.

Broad participation is also important because concerns over the economic and social impact of both climate change and mitigation options may lead to defection. Parties may defect if they perceive that the cost of domestic implementation could put their businesses at a competitive disadvantage to those operating in states that choose not to participate. Thus, the failure of Annex I countries to participate may produce a "domino effect" leading to widespread defection if Parties fear they will bear an unreasonable burden in relative isolation.

Of course, real participation by Parties acting in good faith is also a critical concern. While this issue will largely be dealt with through the compliance regime crafted by the Parties (that is to say, once a Party decides to participate, the measure of its performance is subject to the compliance regime designed under the Protocol), some care should be taken when devising mechanisms to promote participation. However, inducements to participate should not benefit states wishing to receive the rewards of the system without sharing its burdens.

B. Promoting Participation

In his paper on full cooperation, Barrett's analysis of state behavior using the theory of repeated games leads him to conclude that cooperation depends on "whether the payoffs are of a magnitude that make the threat to punish deviations from full cooperation credible."[67] This emphasis on payoff and punishment is important, and it may hold a key to promoting participation in the Kyoto Protocol.

At first glance, punishing non-participation seems impossible because states that choose not to participate have not subjected themselves to the compliance provisions of the accord. Punishment may be an option, however, where participants are able to access valuable, non-public "goods," and non-participants are deprived of access to those goods.[68] In the parlance of the carrot and stick, the stick is withholding the carrot. Where the agreement becomes a preferred, if not exclusive, means of obtaining a good, the non-participating state would face a loss. This is a measurable loss that can be avoided only by joining the agreement. The choice is no longer between benefit and no benefit, but is now between benefit and cost. Failure to participate does not have a neutral result, but in fact results in punishment.

This approach was taken with some success in the Montreal Protocol,[69] where Article 4 specifically requires that parties to the Protocol "shall ban the import of the controlled substances in Annex A from any state not party to this Protocol." In that case, the good was the ability to market Annex A ozone depleting substances internationally. States producing Annex A substances that failed to join the Protocol (and accept its increasingly stringent limits on production) lost their external markets for the product. The only solution was to accede to the agreement: join the "club" and accept its rules.[70]

The Convention on the International Trade of Endangered Species of Flora and Fauna (CITES)[71] also creates a system of trade, subject to strict limitations, only among parties. Similarly, the Basel Convention[72] prohibits parties from granting export rights for hazardous wastes to a non-party, absent a separate bilateral, multilateral, or regional agreement.

The Kyoto Protocol creates a trading regime with access limitations, through the mechanisms of Articles 6, 12, and 17. These "Kyoto Mechanisms" may boost compliance by making the regime more efficient and cost-effective, and they may also boost participation among states where the marginal cost of compliance is sufficiently reduced to make participation feasible. This will discourage "free-riding" by non-participating states that benefit in the long term from a global climate change mitigation system. The impact of the Mechanisms as a means of promoting participation thus cannot be discounted.

At the same time, the goods traded under the Kyoto Protocol are valuable principally to states complying with the Protocol, and have no immediate inherent value to a regime outsider (unlike Montreal's Annex A substances, CITES' exotic species, or even Basel's wastes). While compliance costs may be ameliorated by participants through the Kyoto Mechanisms, the goods created by the Mechanisms lack value outside the regime. Thus, restricting market access cannot be used to punish non-participation by making it inherently costly.

A future climate regime might be designed to apply the lessons from Montreal, CITES, and Basel in this regard, creating a unique and exclusive market, available only to participants, for relevant and inherently valuable goods.[73] Some of the more exotic GHG-producing substances (such as hydrofluorocarbons, perflourocarbons, and sulfur hexafouride) might be treated as goods in this manner, although their relative impact on climate change has been historically small. An effort to restrict access to fossil fuels — the principal source of GHG emissions — would be more problematic.

Without an explicit and exclusive market of this type, the Parties are left with the framework established in the Kyoto Protocol to promote participation — along with more traditional public awareness, political, and diplomatic efforts. Yet the design of a compliance regime under the Protocol does present options for promoting participation. These options depend upon the application of some of the same principles discussed above in the context of national compliance systems — most notably balance, flexibility, and cooperation.

Balance

If the Parties to the Kyoto Protocol can design a compliance system that is fair and balanced in its approach to breach — one that emphasizes cooperation and support while maintaining a credible threat of sanction for persistent or egregious violations — this may in itself encourage participation. Supportive compliance models must be understood to go beyond those that merely promote implementation to those that encourage participation. While the former is fundamental, the latter may have an added benefit of attracting Parties that are uncertain about their ability to meet targets.

The reticence to make a firm commitment may be overcome by a compliance system that emphasizes positive measures even where the country initially fails to comply. Technical cooperation or technical assistance funds that reduce the cost of compliance can be a line of first response for parties out of compliance that have acted in good faith. This type of "reward" for participation and good faith effort, which attaches even should that effort fall short, may provide a powerful incentive for participation by states that hesitate for technical rather than political reasons.[74]

At the same time, a credible threat of sanction (held, in essence, as a tool to punish persistent or egregious violations) may also encourage participation by bringing a sense of fairness to the system, and reassuring states that their efforts will not be subverted by free-riding non-participants or those participating solely to benefit from trade provisions without an intent to pursue the agreement in good faith. Certainly the threat of cheating by treaty counterparts, real or perceived, has prevented states from entering international agreements in the past. For example, the U.S. Senate refused to approve the Comprehensive Nuclear Test Ban Treaty at least in part because some members feared that there would be "cheating" by other parties.[75]

Achieving a balance between soft and hard approaches as part of a fair and credible compliance regime may thus be as important to promoting participation as it is to achieving compliance among Parties that have chosen to participate.

Flexibility

The Kyoto Protocol already promotes flexibility by allowing Parties to choose how they will meet GHG emissions reduction goals. This may also be a critical factor in promoting participation. Parties that are free to choose implementation policies are more likely to participate because they can take the path that they perceive is most cost-effective, while still maintaining national sovereignty.

The same flexibility may be critical in the compliance context, where Parties might be allowed to select cost-effective options to remedy cases of compliance failure, depending on their national circumstances. This may require an institutional structure that is capable of adjusting to the particular needs of a Party, and a framework or institution that is adept at both an enforcement and a supportive role.

Some care should be taken to act within agreed boundaries, and to apply specific guidelines to design an outcome in any given case, in order to avoid concerns about inequity or corruption. In addition, as discussed in the section on national compliance tools, Parties may prefer approaches that are more automatic in some circumstances.

Cooperation

The availability of cooperative mechanisms for compliance, particularly in cases where a Party is facing difficulties in meeting its targets, may be a significant incentive for a state to enter into the climate change regime. The Kyoto Protocol and the Framework Convention contemplate the use of these mechanisms, including information exchange, technology transfer, and technical support. A technical compliance fund, administered for example through the Global Environment Facility (GEF), could reserve money for states participating in the Kyoto Protocol that need support to meet their target. While a relatively small number of Annex I states are GEF eligible, some consideration could be given to expanding eligibility where it relates to climate change commitments, or to creating a supplemental fund with broader eligibility criteria.[76] In those cases where the perceived technical, political, or economic burden of compliance may

discourage participation, the promise of a supportive and cooperative compliance regime can help neutralize concerns and promote participation.

In some cases, offering cooperation (such as technology transfer) only to Parties participating in the Protocol may create a good that is otherwise unavailable to non-participants. Although care would need to be taken to avoid running afoul of World Trade Organization rules on non-tariff trade barriers, the creation of an exclusive market for technology or other economically important goods solely among Parties could substantially enhance the desirability of participation in the Kyoto Protocol and future agreements under the Framework Convention.

V. Conclusions

The behavioral change necessary to reduce greenhouse gas emissions and combat global climate change will in some cases be motivated by rewards, and in others by the potential for punishment. While legal systems vary in relying on one or another of these models, there is a growing trend toward building frameworks that incorporate both rewards and punishments — soft and hard mechanisms — to motivate behavior consistent with public policy. This trend toward seeking a balance may be critical in achieving meaningful compliance with climate change commitments.

National systems that can achieve this balance will encourage cost-effective practices in a supportive regulatory environment even while setting minimum expectations that establish a baseline for progress. While the nature of the balance and the specific tools applied on either end of the scale will vary by national interest, tradition, needs, and priorities, there seems little doubt that a full range of tools will be required to promote compliance at a national level.

Where national compliance systems can be complemented, coordinated, and integrated with international systems, results are likely to be even stronger. National governments acting within relevant economic, political, and legal contexts can take more targeted steps to address climate change concerns — even with some degree of international cooperation. States exercising their sovereignty are also more capable of claiming jurisdiction over relevant entities where necessary to compel attention to policy choices. As the report outlines, there are a range of compliance options available to national and subnational governments that can be applied effectively in the context of climate change.

Domestic laws and institutions will also play a critical role in building an effective monitoring and verification system under circumstances where emissions must be estimated and domestic implementation strategies vary greatly. Given the range of implementation options and the technical complexity of estimating GHG emissions reductions, integrating national systems and institutions will speed procedures, strengthen the credibility of estimations, and minimize sovereignty concerns. The report outlines

the importance of adapting national procedures and institutions to the verification of climate change compliance, and emphasizing international cooperation, integration, transparency, independent study, redundancy, and consequence-based deterrence to promote a cost-effective and reliable system.

Finally, meaningful compliance must be taken to mean broad participation, and not just the adherence of a handful of Parties to the commitments embodied in the Kyoto Protocol. The success of the Protocol will depend on an aggregate average of emission reductions, and it cannot be effective if only a handful of states accept and observe its conditions. Because climate change is a global concern that calls for global solutions, any meaningful system should seek to encourage participation even as it discourages non-compliance.

The report highlights the importance of balance, flexibility, and cooperation to encourage participation, and describes instances where these principles have been applied in other relevant international agreements. It also outlines how the Kyoto Protocol is already designed, in part, to promote participation through cooperative measures and market-based trading mechanisms, but argues that attention might be given to further measures — systems of both reward and sanction — that can boost participation in the Protocol and future agreements.

In sum, Parties must look to their own domestic compliance systems, and work to strengthen those systems even as they debate the international regime that will measure and promote national performance. The international regime will be considerably strengthened where it is a supplement to, and not a substitute for, national compliance systems. It will also benefit from credible monitoring and verification that is linked to national systems, and from efforts to encourage participation from the broadest possible range of Parties. Without these steps, meaningful compliance cannot be achieved. And without meaningful compliance, global climate change commitments will be little more than wish lists.

Appendix A: Compliance-Relevant Provisions of the Framework Convention and the Kyoto Protocol

Table A-1

Framework Convention Commitments Article 4

1. All Parties shall (Article 4.1):

(a.) Prepare national emissions inventory.

(b.) Develop programs containing measures to mitigate climate change, including:

- Addressing sources;
- Addressing removals by sinks; and
- Facilitating adaptation.

(c.) Develop and transfer technologies, practices, and processes.

(d.) Promote sustainable management of sinks.

(e.) Cooperate in preparing for adaptation.

(f.) Take climate change into account in national economic and social policy.

(g.) Conduct research, systematic observation, and data collection.

(h.) Exchange scientific, technical, and legal information.

(i.) Promote education, training, awareness, and public participation.

(j.) Communicate to secretariat.

2. Annex I Parties shall (Article 4.2):

(a.) Adopt national policies and take corresponding measures on the mitigation of climate change by:

- Limiting emissions and
- Enhancing sinks and reservoirs.

(b.) Coordinate economic and administrative instruments developed to achieve Convention objective, and identify policies and practices that lead to emissions.

Developed Country Parties Shall (Article 4.3 - 4.5):

3. Provide new financial resources to help developing countries meet costs.
4. Assist developing countries vulnerable to climate change effects.
5. Promote, facilitate, and finance technology transfer.

Special Considerations (Article 4.6 - 4.10):

6. Allow flexibility for Newly Independent States.
7. Recognize that developing countries' performance is linked to support.
8. Give full consideration to "special needs" countries (including those most prone to climate change effects and those dependent on fossil fuel income).
9. Take account of special needs of least developed countries.
10. Take into consideration economies vulnerable to climate change effects.

Table A-2

Kyoto Protocol **Compliance-Relevant Provisions**

Article	Subject	Compliance Relevance
3.1	Emission Reduction Commitment	This provision creates a legally-binding numeric target for Annex B Protocol signatories to meet.
4	Meeting Commitments Jointly	This provision allows Annex I Parties to meet commitments jointly under agreed terms. If the Parties fail to meet their aggregate emissions reduction, their responsibility shifts to their agreed levels.
5	Emission and Removal Estimation	Requires that Annex I Parties have in place, on or before January 1, 2007, a "national system" for estimating anthropogenic emissions and removals by sinks of GHGs. Methodologies for estimation are to be accepted by the Intergovernmental Panel on Climate Change (IPCC) and agreed by COP.
7	Emission Reporting	Requires that annual emission/removal inventories incorporate "necessary supplementary information for the purposes of ensuring compliance with Article 3," and that communications under Article 12 of the Convention incorporate supplementary information "necessary to demonstrate compliance."
8	Emission Review	Expert review teams composed of experts chosen through nominations by the Parties will review information submitted under Article 7, and provide a "comprehensive technical assessment of all aspects of the implementation by a Party" and a separate report to the COP/MOP "identifying any potential problems in, and factors influencing, the fulfillment of commitments."
6, 12, & 17	Kyoto Mechanisms	Three new ways to achieve compliance with Article 3.1 numeric reduction commitments. Article 6 allows the transfer of emission reduction units between Annex I Parties implementing projects jointly, Article 12 establishes a "clean development mechanism" that allows Parties to obtain certified emission reductions from projects in non-Annex I countries, and Article 17 allows emissions trading between Annex B Parties.
13.4	COP/MOP Implementation Review	Enables COP/MOP to keep implementation under "regular review" and to make decisions "necessary to promote its effective implementation."
18	Consequences	The first COP/MOP will approve "appropriate and effective procedures and mechanisms to determine and to address cases of non-compliance," including an "indicative list of consequences." Any procedures or mechanisms "entailing binding consequences" must be adopted as amendments to the Protocol.

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Endnotes

1. See, for example, Victor, David G., et al., ed. *The Implementation and Effectiveness of International Environmental Commitments: Theory and Practice,* MIT Press, Cambridge, MA USA (1998); Chayes, A. and Chayes, A.H., *The New Sovereignty: Compliance with International Regulatory Agreements,* Harvard University Press, Cambridge, MA USA (1995).

2. There are a number of important efforts to address climate change compliance issues within academic and policy circles, some of which are described in the Bibliography appended to this report.

3. UN Framework Convention, Articles 4 and 12.

4. Kyoto Protocol, Article 7.1 and 7.2.

5. Kyoto Protocol, Article 8.1 – 8.3.

6. The text states that "procedures and mechanisms...entailing binding consequences shall be adopted by means of an amendment" to the Protocol Kyoto Protocol. Article 18.

7. Chayes, A. and Chayes, A.H., 1995.

8. For a further discussion of soft versus hard instruments, see generally Wiener, Jonathan B., *Global Environmental Regulation: Instrument Choice in Legal Context,* 108 Yale Law Journal 677 (January 1999).

9. See, e.g., Solid Waste Disposal Act § 3008, 42 USC § 6928(d)(3).

10. Vogel, David, *National Styles of Regulation: Environmental Policy in Great Britain and the United States,* 1986.

11. Staats, Henry P., "Dutch Industrial Target Group Approach: An Enforcement Study on the Voluntary Environmental Agreement with Petrol Stations," reported in Fourth International Conference on Environmental Compliance and Enforcement Chiang Mai, Thailand, April 1996, *Proceedings,* Vol. 1 at 427 (hereafter Chiang Mai Report).

12. International Enforcement Workshop, Utrecht, The Netherlands, May 1990, *Proceedings,* Vol. II at 115.

13. Ibid.

14. Fifth International Conference on Environmental Compliance and Enforcement, Monterey, California, November 1998, *Proceedings,* Vol. 2 at 27.

15. See web site for the U.S. Environmental Protection Agency: http://www.epa.gov/docs/acidrain/ardhome.html; see also "From Obstacle to Opportunity: How Acid Rain Emissions Trading is Delivering Cleaner Air," Environmental Defense, September 2000.

16. Krahn, Peter K., *Enforcement Versus Voluntary Compliance: An Examination of the Strategic Enforcement Initiatives Implemented by the Pacific and Yukon Regional Office of Environment Canada 1983 to 1998* (1998).

17. Ibid.

18. For example, a key sector that is at a competitive disadvantage because of unusual circumstances may require a more supportive approach.

19. Co-author Dannenmaier was a participant in the meeting, and this quote is based on his recollection of the discussion as well as the official report of the meeting. See Chiang Mai Report, Vol. 1, at 399.

20. Chiang Mai Report, Vol. 1, at 400-01.

21. New Directions Group, "Criteria and Principles for the Use of Voluntary or Non-Regulatory Initiatives to Achieve Environmental Policy Objectives," November 1997.

22. Organisation for Economic Co-operation and Development, *Voluntary Approaches for Environmental Policy: An Assessment,* 1999.

23. Bartheneuf, Calderon, J.L., *Environmental Auditing in Mexico,* 1999. Bartheneuf was at the time Under Attorney for Environmental Audit in the office of the Federal Attorney for the Environment.

24. Ibid. Reported figures were 8.5 billion Mexican Pesos in private expenditures and 90 million Pesos in government expenditures. Conversion to U.S. dollars was made using an average exchange rate for the period of the program (following conversion to the new Peso), from January 1993 to June 1998: .23148 U.S. Dollars to 1 Mexican Peso. Historic currency rates obtained from Onanda.com currency site: http://www.oanda.com/convert/fxhistory.

25. "Due Process" is, in essence, the exercise of governmental authority in a manner consistent with settled rules of law in such a way that safeguards individual rights. In United States jurisprudence, for example, it has been held to imply that a dispute must be heard by a tribunal competent (authorized) to hear that dispute, that the dispute be settled in accordance with established and accepted substantive rules, and pursuant to procedural safeguards that allow the person affected to be aware of the subject in dispute, to be present before the tribunal, to be heard, and to have the right to offer proof on all material facts that bear on the dispute. See, *Pennoyer v. Neff,* 95 US 714, 733 (1877).

26. Lubbe-Wolff, Gertrude, *Modernisierung des Umweltordnungsrechts: Vollziehbarkeit – Deregulierung – Efficienz, Bonn, Economica Verlag, 1996;* Cited in *Indicators of Effective Environmental Enforcement: Proceedings of a North American Dialogue,* March 1999.

27. "Civil society" is meant to refer to all non-governmental actors, including individuals, businesses, business associations, environmental organizations, and non-profit institutions.

28. Rio Declaration on Environment and Development, Adopted by the UN Conference on Environment and Development (UNCED) at Rio de Janeiro, 13 June 1992. UN Doc. A/CONF.151/26 (Vol. 1) (1992). Principle 10. See also, Dannenmaier, Eric, "Democracy in Development: Toward a Legal Framework for the Americas," 11 *Tulane Environmental Law Journal* 1 (Winter 1997).

29. See, e.g., Dannenmaier, Eric, "Legal Frameworks for Public Participation in the Americas," *Technical Paper,* Washington, D.C., Organization of American States, Unit for Sustainable Development and Environment, 1998.

30. Ibid.

31. Clean Air Act § 114, 42 USC § 7414(c).

32. Ibid. § 7413(g).

33. Federal Water Pollution Prevention and Control Act (Clean Water Act) § 505, 33 USC § 1365.

34. For a useful survey of public participation provisions in multilateral environmental agreements, see Wiser, Glenn, "Transparency in 21st Century Fisheries Management," available at http://www.ciel.org.

35. There may be some performance data that can be collected directly, such as confirmation of forest cover in an area designated as a carbon sink, or confirmation of fuel conversions at utility facilities. While it will be possible to directly confirm that certain policies have been implemented, the GHG reductions from those policies will still be subject to estimation.

36. The Conference of the Parties to the Framework Convention (COP) is working to develop guidelines for national estimating and reporting systems under Articles 5, 7, and 8, through the work of the Subsidiary Body for Scientific and Technological Advice and through consultations among Parties. (Decision 8/CP.4)(1988).

37. The Kyoto Protocol calls for submissions that provide "the necessary supplementary information for the purposes of ensuring compliance." (Kyoto Protocol Art. 7) Because national programs are so critical to obtaining Protocol compliance, the supplementary information should be used to highlight national compliance program successes and failures, and to build stronger domestic models on the basis of these lessons learned.

38. Concluded at Washington, D.C., 2 March 1973. Entered into force 1 July 1975. Reprinted in 12 I.L.M. 1085 (1973).

39. This figure is taken from a graphic distributed by the Climate Change Secretariat at the March 2000 meeting of the Joint Working Group on Compliance. The Secretariat noted that the chart was for illustrative purposes, and the figures were approximate, but they do provide some reasonable estimate of the time that would be needed to conduct an adequate review of compliance submissions.

40. Kyoto Protocol, Article 7.

41. Often, the objective of international environmental agreements is, in part, to provide a basis for parties to cooperate on issues of mutual concern. Thus, the act of cooperation can become a type of self-monitoring mechanism.

42. Concluded at Barcelona, February 1976. Entered into force 12 February 1978. Reprinted in 15 I.L.M. 290 (1976).

43. Ibid. Articles 11 and 12.

44. Dullforce, William, "Mediterranean Sea and Sand Given A Cleaner Bill of Health," *Financial Times,* July 27, 1988.

45. Concluded 22 March 1989. Entered into force 5 May 1992. Reprinted in 28 I.L.M. 756 (1998) (Basel Convention).

46. Basel Convention, Article 6.

47. Basel Convention, Article 13.

48. UN Document A/50/1027, Annex, August 26, 1996. The UN General Assembly adopted the treaty by Resolution 50/245 on the Comprehensive Nuclear Test Ban Treaty (UN Document A/RES/50/245, September 17, 1996).

49. United Nations Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on Their Destruction, 36 I.L.M. 1507 (1997).

50. Afsah, Shakeb, *Project Completion Report for US-AEP's PROPER Project in Indonesia,* International Resources Group, 1999.

51. See World Trade Organization web site at http://www.wto.org.

52. See International Monetary Fund web site at http://www.imf.org.external.

53. The Kyoto Protocol does contemplate non-governmental participation in emissions trading, but the NAFTA process is targeted specifically at compliance concerns.

54. The full process is outlined in the NAFTA Environmental Side Agreement, Articles 14 and 15.

55. See generally, Markell, D., "The Commission for Environmental Cooperation's Citizen Submission Process," 12 *Georgetown International Environmental Law Review* 545 (2000).

56. Australia has identified peer review as a "compliance-pull" mechanism, with a facilitative — rather than legalistic — quality. "5 August 1999 Preliminary Response Related to a Compliance System," FCCC/SB/1999/Misc.12 at 4.

57. "Ensuring Compliance with a Global Climate Change Agreement," OECD Information Paper (1998), ENV/EPOC(98)5/REV1 at 50.

58. MARPOL 73/78. Reprinted in 30 I.L.M. 733 (1991).

59. Downs, G.W., D.M. Rocke, and P.N. Barsoon, "Is the Good News About Compliance Good News About Cooperation?" *International Organization* 50:533-56 (1996).

60. Barrett, Scott, "A Theory of Full International Cooperation," *Journal of Theoretical Politics* 11(4):519-541 (1999) at 523.

61. Ibid.

62. Concluded at Montego Bay 10 December 1982. Entered into force 16 November 1994. UN Doc. A/CONF.62/122. Reprinted in 21 I.L.M. 1261 (1982).

63. Concluded at Rio de Janeiro 5 June 1992. Entered into force 29 December 1993. Reprinted in 31 I.L.M. 818 (1992).

64. See generally Hubbard, Amanda, Comment "The Convention on Biological Diversity's Fifth Anniversary: A General Overview of the Convention — Where Has It Been and Where Is It Going?" 10 *Tulane Environmental Law Journal* 10:415, 1997.

65. Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1992 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, 4 August 1995. Not yet in force. UN Doc. A/CONF.164/38 (1995). Reprinted in 34 I.L.M. 1542 (1995).

66. See, e.g., Wigley, Tom M.L., "The Science of Climate Change: Global and U.S. Perspectives," Pew Center on Global Climate Change (1999).

67. Barrett at 526.

68. Non-public goods can include those that are inherently private (such as manufactured goods) or those to which access is restricted (such as fishing rights).

69. Montreal Protocol on Substances that Deplete the Ozone Layer, adopted 16 September 1987. Entered into force 1 January 1989. Reprinted in 26 I.L.M. 1559 (1987).

70. These exclusive dealing arrangements may be viewed as undesirable sanctions or trade barriers by some, and attention should be given to whether such arrangements might be deemed to run afoul of the trading rules administered by the World Trade Organization (WTO). In the 1990 General Agreement on Tariffs and Trade (GATT) Panel Report *Mexico v. United States* (also known as the Tuna-Dolphin Panel Report), the panel raised the possibility that some trade measures in multilateral environmental agreements might be inconsistent with WTO trading rules, which are structured to eliminate restrictions by WTO members on the importation, exportation, or sale for export of products. See Panel Report on *United States — Restrictions on Imports of Tuna,* 3 September 1991, DS21/R (not adopted). While this report was never formally adopted and the Panel's suggestion has been criticised in a number of quarters, trade measures that are used to encourage participation should be drawn with an eye to the possible influence of the WTO. See generally Petsonk, Annie, "The Kyoto Protocol and the WTO: Integrating Greenhouse Gas Emissions Allowance Trading into the

Global Marketplace," 10 *Duke Environmental Law and Policy Forum* 185 (1999), available at http://www.duke.du/journals/10DELPFPetsonk; Brack, Duncan, et al., *International Trade and Climate Change Policies,* The Royal Institute of International Affairs, Earthscan London, 2000.

71. Concluded at Washington, D.C., 2 March 1973. Entered into force 1 July 1975. Reprinted in 12 I.L.M. 1085 (1973).

72. Basel Convention.

73. Compare Petsonk, Carol A., "The Role of the United Nations Environment Programme (UNEP) in the Development of International Environmental Law," 5 *American Journal of International Law and Policy* 351 (Winter 1990) for a discussion of the obstacles to creating a producer "cartel" for hazardous wastes under the Basel Convention.

74. Good faith may not always be easy to measure objectively, but the task is not impossible. Many legal systems rely on the principle to assess the performance of a party in a broad range of circumstances, from cases of contract to negligence. It is likely that objective indicators could be developed to measure good faith effort in the climate change context.

75. See, e.g., Senator Rod Grams, Press Release, Federal Document Clearing House, December 8, 1999; Sen. George V. Voinovich, R-Ohio, Letter to the Editor, *The Cincinnati Enquirer* October 31, 1999; Kissinger, Henry, "Stop the Name-Calling Over Nukes," *The Houston Chronicle,* November 21, 1999.

76. Annex I countries eligible for GEF funding are limited to countries in transition to market economies.

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