Enforcing Compliance:

The Allocation of Liability in International GHG Emissions Trading and the Clean Development Mechanism

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I N T E R N E T E D I T I O N

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About the Author

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Kerr has also worked extensively on the U.S. lead phasedown program, focusing on transaction costs and on technology adoption responses to the regulation. Although Kerr has resided in the U.S. since 1990, she is a native New Zealander, and continues to be actively involved in New Zealand policy making, particularly on climate change issues and the New Zealand Resource Management Act.

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About RFF

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In light of international debate over possible agreements to limit emissions of greenhouse gases, RFF launched its **Climate Economics and Policy Program** in October 1996 to increase understanding and knowledge of the complex issues that must be addressed to design appropriate domestic and international policies that are effective, reliable, and cost-efficient. The program responds to both the long-term debate about climate change, and the specific debates surrounding the negotiations being carried out under the United Nations Framework Convention on Climate Change. It integrates the many different aspects of climate change with ongoing basic and applied research at RFF involving energy markets, water and forest resource management, air pollution, environmental regulation, and sustainable development.

To support a well-informed public, RFF provides regular reports of its climate change activities to the news media, posts program updates and activities on RFF's internet home page (http://www.rff.org), and maintains **Weathervane**, an internet forum devoted to the discussion and debate of global climate policy (http://www.weathervane.rff.org).

The possibility of international trade in credits for greenhouse gas (GHG) emission reductions is a key "flexibility mechanism" built into the December 1997 Kyoto Protocol for international GHG reduction. The Protocol allows ntities in Annex I countries (the industrialized countries agreeing to cap their total emissions) to trade emission reductions. Through the "Clean Development Mechanism" (CDM), investors in Annex I countries also can secure GHG reduction credits for emission-reducing activities in non-Annex I developing countries that have not accepted national emission caps.

For these forms of international emissions trading to be seen as credible forms of real emissions reductions, legal responsibility, or liability, must be assigned for the failure of promised emission reductions embodied in the credits to materialize. While a well-functioning compliance system is crucial for the integrity of trading, however, excessive restrictions on trading to enforce responsibility could stifle emission credit markets and raise international compliance costs to unacceptable levels. The desirable allocation of liability trades off these two concerns.

Liability for the "quality" of an emission reduction credit when created could rest with buyer, seller, or both parties; it also could stay with whoever originally is assigned the liability, or the liability could be transferred as credits are resold. A very high level of compliance by sellers could always be ensured by "gold plating" credits or permits. Before credits can be sold we could require they be certified by an independent agent. Buyers and sellers would then have to decide how often to bring in the certifiers, trading off the costs of more frequent quality control against the advantage of a more continuous flow of certified credits or permits. Since this approach is likely to be quite expensive, either because of certification costs or illiquidity, we focus in this paper on systems that allow trading of emission permits or credits prior to certification with post-trade liability rules that aim to enhance the credibility of trading.

Designing good compliance systems would be easy if everybody – traders and governments – had lots of information about the emission-reducing activities of different entities and there were strong legal sanctions within every participating country for nonperformance. In practice, information is scarce and not evenly shared, and both domestic and international enforcement mechanisms are limited in what they can accomplish. Starting with these two points, we first consider some of the general institutional background for international emissions trading. We then consider the assignment of liability in an international GHG trading system for the Annex I developed countries, focusing on the assignment of liability for "bad" emission permits when the seller country is not in compliance with its Kyoto targets known as "assigned amounts." We turn then to address issues of credibility and liability in the context of CDM joint ventures.

The Institutional Backdrop for Emissions Trading and Liability

As noted above, the Kyoto Protocol envisages two different kinds of international emissions transactions.* Exchange among actors in Annex I countries could involve international trade in homogeneous "emissions permits" created by individual countries in pursuit of their domestic implementation of the Kyoto targets, or the exchange of project-specific emission reduction credits. In either case, the goal of emission permit or credit buyers would be to obtain credits at lower cost than their own domestic compliance efforts, while still achieving the Kyoto targets. The CDM transactions involve specific joint ventures between actors in Annex I countries and actors in non-Annex I developing countries, wherein the former invest in the latter to obtain emission reduction credits which are less costly for the investor than other forms of GHG control. These projects were referred to previously as joint implementation, but that term now is reserved for project-specific credit trades among Annex I countries.

Under the Kyoto Protocol, ultimate responsibility for meeting the numerical emission control obligations rests with the national governments of Annex I countries. The Protocol contains provisions for calculation of national emission inventories and for deployment of sanctions in the event the targets are breached. However, these sanctions have not yet been specified, and monitoring is imprecise. Moreover, since participation in the Kyoto Protocol and the underlying Framework Convention on Climate Change are voluntary decisions by sovereign nations, the ability to exact sanctions inherently is limited; participation must be in the self-interest of every signatory. While sanctions are difficult to apply internationally, they could be adopted by mutual consent to apply when national compliance falls short. The sanctions could include having a lower national assigned amounts in subsequent commitment periods (to "make up its environmental debt"). Within a trading program, sanctions on selling countries that are out of compliance also could include strictures on future trading opportunities (future permits or credits might

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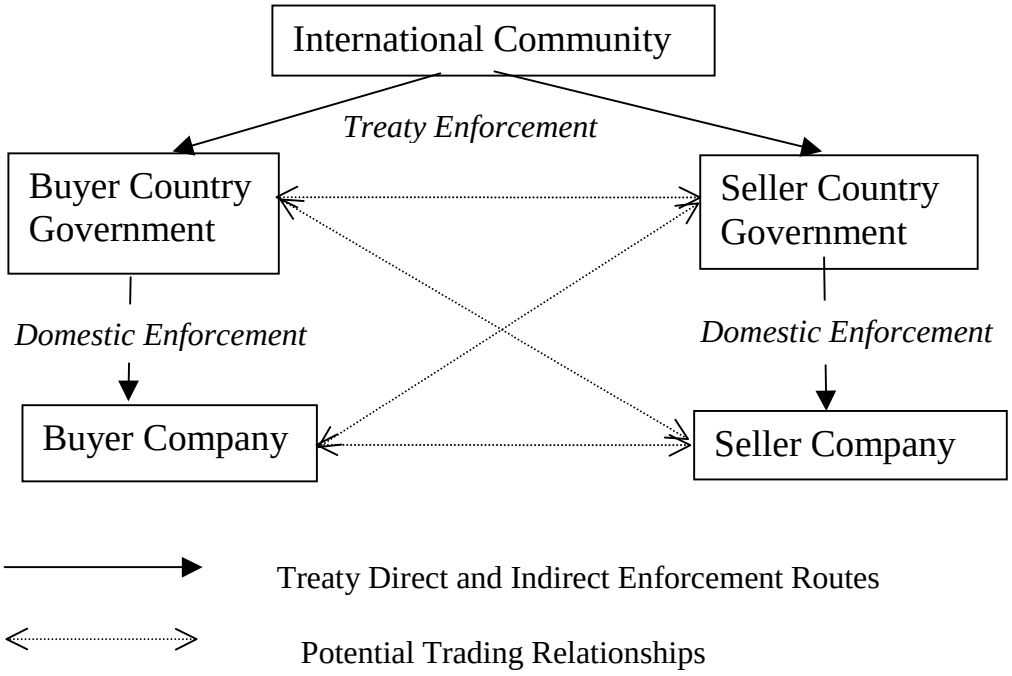
* The Protocol also allows countries to pool and redistribute their assigned amounts, as the members of the European Union have done. We see this effort primarily as an extension of the international negotiation process, distinct from the market-oriented activities involving private-sector entities that are the focus here.

be sold at a previously agreed discount, or the capacity to trade might be suspended entirely). When governments delegate emission trading privileges to sub-national parties ("legal entities" in the parlance of the Kyoto Protocol), they will apply domestic enforcement pressure because if their companies cheat and are caught, the government is still ultimately responsible.

Figure 1 illustrates the various combinations of trading and enforcement activities. Efficiency of trading is likely to be greatest when buyer and seller both are sub-national private actors with incentives to make the best deal given the specific information about trading opportunities they possess. However, it is certainly possible that some buying and selling will be done by governments on behalf of or in lieu of their private sectors.

Figure 1: International and Domestic Enforcement and Potential Trades



In CDM transactions seller countries do not have emission obligations so do not have national baselines against which to measure emission reductions. Project-level reductions, referred to in the Protocol as "certified emission reductions" (CERs), are measured by assessing the additional reduction achieved relative to some notion of business as usual (BAU). This is a controversial and costly process. BAU is inherently difficult to define, and burdensome project-by-project review will chill incentives for cost-effective CDM investments; yet a generous definition of "additionality" may involve "creating" CERs that do not reflect real reductions.

Parties to the Kyoto Protocol could minimize the costs of assessing CDM emissions reductions and reduce manipulation of baselines by determining a set of generic criteria for evaluating the additional GHG reductions associated with different classes of investments (e.g., enhancements in the power sector,

improvements in end-use efficiency, use of low-GHG renewables). These criteria would be to a significant extent arbitrary and would require revision periodically with experience, but they would provide a way to avoid the arduous and equally arbitrary project-specific determination of additionality.

In both Annex I and CDM trading, even where non-compliance is clearly defined and measurable and sanctions are used, because monitoring is not perfect and sanctions are limited, parties may misreport reductions or claim inability to meet targets after the fact. In particular, sellers may sell more credits than they really create. Assignment of liability for the validity of credits after the fact is key for controlling these behaviors in a permit market. The question we address is, "Which country should bear liability for the validity of traded credits, the buyer, the seller, or both?" The fact that Annex I and CDM transactions involve different actors and operate under different domestic regulatory structures leads us to different conclusions about how responsibility for the integrity of the trading system should be imposed.

Before turning to these issues, we briefly address the general question of whether international trading increases the general risk of noncompliance with the Kyoto Protocol. Some observers correctly point to the fact that if entities in some countries can create and sell credits not backed by real emission reductions, the resulting "export" of noncompliance can magnify the compliance problem. On the other hand, the capacity to enforce national commitments internationally is inherently limited, as already noted; compliance will not be perfect in the absence of trading either.Moreover, the same monitoring problems that complicate implementation of a credible trading system also bedevil the assessment of compliance without trading. Finally, but perhaps of greatest importance, because a successful trading system will reduce compliance costs it should strengthen national incentives to meet the obligations of the Kyoto Protocol.

Performance Risks and Remedies in Annex I Trading

As already noted, Annex I trading involves either trading of homogeneous permits based on national emissions or bilateral contracts for the creation and exchange of project-related credits. In either case, the fact that the actors trading all are in Annex I means that their respective governments are ultimately responsible for their actions and all trading entities should be governed by their domestic compliance mechanisms. The Kyoto Protocol requires each Annex I country to develop an operational capacity to keep track of their aggregate net emissions, and a capacity to develop and implement policies and measures to credibly ensure that those emissions remain within the negotiated targets.

If these mechanisms worked as they were supposed to, then effectuating international GHG trading would require only a relatively minor increase in bookkeeping capacity. Whether the domestic systems of both countries are permit-based, or one or both countries allows only project-based trades at the sub-national level, regulators in the buyer and seller countries need to keep track of the volumes of the international flows. Then they need to adjust domestic emissions accordingly for the purpose of evaluating domestic compliance. Note that while it may be useful to keep track of where the permits flow, there

is no need to keep detailed regulatory records of individual buyer and seller transactions in this case. If, for example, a US permit holder sold some US permits to a Japanese entity, it would suffice for the seller's permit balance to be debited by US regulators and for Japanese regulators to note that the buyer has obtained a greater capacity to emit. Aggregate flows among countries would need to be recorded as a cross check on each country's report of buying and selling.

In practice, things could go wrong. Sellers could simply sell more permits than they create and openly not comply with their commitments under the Protocol. Alternatively, sub-national sellers could hide their noncompliance by inflating the number of credits created in a project when they report to their national regulators. The national regulators in seller countries could report higher levels of permits sold than emissions they really reduced. These misleading reports would be given to the international bodies charged with overseeing compliance under the Framework Convention and Kyoto Protocol. Even if buyers observe misreporting or know that the seller will not be able to comply, they may collude with the seller in order to get cheaper credits. For example, Russia could sell more credits than they really created (their assigned amount minus actual emissions) and a firm in the US could buy them cheaply despite knowing that they are probably "bad" permits.

In response to concerns about this potential threat to the credibility of Annex I trading, a number of proposals have been offered for assigning liability for "bad" permits or credits, those coming from a non-compliant seller country. Within Annex I, seller countries are always liable for the sum of net emissions plus permit sales being below their assigned amount. The question is whether the buying side should also be liable. If buyer countries are also liable, the buyer country government would be responsible for covering their ex post "carbon deficits" if part of their obligations had been met with the purchase of permits or credits from a country found later to be non-compliant. It could be required to purchase additional "secured" permits or credits from other sources, as well as being sanctioned. In all likelihood, the finding of noncompliance in the seller country would be based primarily on an accounting of aggregate emissions plus sales versus assigned amounts, though it is possible that some spot checking of individual project-based transactions also could occur.

Buyer liability could put all transactions with that country at risk. Alternatively, only those permit or credit sales beyond some target level of seller country emissions might be subjected to this caveat emptor test. For example, Russia could sell credits equal to the difference between its emission quota under the Kyoto Protocol and its 1998 emissions or some other target level – the so-called hot air – without triggering buyer liability, but sales beyond that mark would be caveat emptor. Another alternative would be the "last in-first out" system, where permits would be made invalid in reverse order based on the date of trade until the seller was back in compliance.

Introducing buyer liability to Annex I trading in addition to seller liability will increase compliance, but it may do so at high cost relative to the gains and relative to the costs of increasing compliance pressure on sellers. We believe the costs of this approach will outweigh the benefits.

For buyer liability to be beneficial, buyers must have a comparative advantage relative to the international community either in monitoring or responding to seller non-compliance. In addition, whoever

is liable will bear the residual risk of performance failure that is beyond their control and thus the risk of penalties for noncompliance. For buyer liability to be beneficial, buyers must not be so risk-averse that bearing these risks would drive large numbers of potential trades from the market.

If these conditions hold it could be efficient for the international community to "employ" the buyer as an enforcer, with the threat of sanctions as the incentive, rather than increasing efforts to enforce seller compliance. In this system buyers would affect seller behavior by monitoring seller conduct and then responding to the information they obtain either by changing their choice of trading partners, offering less for more risky credits, or sanctioning non-complying sellers directly. If buyer countries were liable for seller non-compliance, buyer countries and their sub-national actors, to whom they pass the liability, would undertake a variety of risk management measures. Expert assessments of noncompliance risk would be developed to help buyers gauge the probabilities of having their permits or credits devalued, and these probabilities would be used by buyers to discount the price of purchased credits from less secure sources accordingly. Buyers would refuse to trade with especially risky sellers. In response reliable sellers would try to provide transparent information on their compliance. Buyers also could directly punish non-compliant sellers through standard international contract law.

However, early on in the advent of international GHG trading neither buyers nor intermediaries are likely to have a strong comparative advantage in assessing the prospective conduct of sellers, particularly when permit validity depends on national, not project-level compliance. Anything an individual buyer could do to monitor another country's GHG production, or to subcontract monitoring to specialists, also could be done (perhaps better and more cheaply, with less duplication) by international bodies charged with overseeing the Protocol. Market reputations about seller conduct also will take some time to develop.

Buyers' options for directly policing or controlling seller behavior are inherently limited if defectiveness of credits is based solely on national aggregate emissions of the seller country rather than project-specific findings. In particular, with homogeneous permits, buyer liability is a form of joint and several liability that imposes the burden of non-compliant conduct by one seller (national or sub-national) on all buyers. No buyer, and no sub-national seller, can control the risk of national non-compliance.

Even with a careful choice of sellers, buyers will still face residual risks beyond their direct control to which they will have to respond by holding additional credits as a reserve margin or buying insurance from a broker. These are direct costs to buyers and to society as a whole that could be avoided if the international community put in place more direct sanctions against noncompliant seller countries. These costs are borne for "good" trades as well as "bad" ones and hence limit trading by reliable sellers as well as those who are unreliable. Risk-averse buyers will tend to be overly cautious and discount or exclude many "good" trades. The resulting loss of legitimate gains to trade could be significant.

In considering the tradeoff between this loss and the goal of increased reliability of trading, it is also important to keep in mind that shared liability between buyers and selers could reduce the incentives for credible trading sellers may face under the Protocol. While the financial sanctions against Annex I sellers have not yet been articulated, they may be stronger than those available against non-compliant buyers. Overall incentives for compliance thus could actually fall under shared buyer and seller liability.

We believe that on balance an appropriately defined seller liability program is the best way to allocate liability for performance failures in trades by most Annex I countries. The sanctions would have to be serious enough to motivate seller country governments to comply and to deter cheating by their private actors (e.g., forfeiture of future assigned amounts, limits on future access to the market). These are reasonably credible and potentially serious sanctions.

An effective seller liability program in Annex I must distinguish sellers with good reputations and domestic enforcement from those whose weaker enforcement engenders more uncertainty about the credibility of their permits. To do this, we propose coupling qualifying requirements for Annex I countries to sell permits in the Annex I trading market with whatever after-the-fact sanctions are devised by the Conference for non-compliant Annex I sellers. The qualifying requirements would distinguish higher-risk sellers in advance and prevent them from creating large numbers of invalid permits.

The details of the qualifying conditions would themselves be subject to international negotiation. The national qualification process presumably would look at countries' domestic monitoring and enforcement capabilities (including the general strengths of the legal systems for regulatory and contract enforcement), past treaty compliance, and perhaps at other factors that bear on their commitment and capacity to meet their obligations. Countries that fail to meet the qualifications would still be able to sell credits, but only after national emissions during the commitment period have been certified (i.e. at the end of the commitment period), or through the project-level CDM mechanism described below, with buyer liability. A more complex variant of this approach would impose various discounts on credits of countries that failed to fully meet all the qualifying requirements. While determining a more fully articulated set of qualification criteria and applying them in practice would be inherently subjective, the problem does not seem that much greater than determining countries' eligibility to participate in the IMF or WTO.

Ultimately, for the trading program to work well and help achieve the goals of the Convention, the combination of preconditions and the threat of future sanctions must deter cheating by sellers in the permit market. Countries may simply walk away from their Framework Convention obligations, but this is a problem with or without trading. As already noted, trading may enhance incentives for compliance by reducing the costs. What is important, especially in the early stages, is to do as much as possible to develop a liquid and flourishing international trading system among Annex I countries subject to some basic credibility tests. We may have to live with the system we create for a considerable period. We want a system that has low transaction costs, many trades, low national compliance costs, and consequently strengthens national interests in reducing GHG emissions.

Performance Risks and Remedies in Trading Under the Clean Development Mechanism

The situation with the CDM is fundamentally different from Annex I trading in at least three important respects. First, developing country hosts of JI/CDM projects are not currently obligated to cap aggregate emissions. These governments thus do not have the same obligations for policing the perfor-

mance of domestic GHG abatement as their Annex I counterparts. Second, it is clear that a number of non-Annex I countries have less technical and institutional infrastructure for overseeing JI/CDM project results and enforcing contractual performance obligations than their counterparts in Annex I. Third, Annex I actors obtaining the emissions credits also have a direct involvement in financing and possibly managing the investment project producing the credits. Their comparative advantage in monitoring and enforcement, and the prospects for collusion to misrepresent project results, do not arise with more arms-length permit or credit transactions.

Consider the problem of a seller inflating the results of a CDM project to increase the number of certified credits that can be sold. If the buyer observes this and is not liable for the validity of the credits, it has no incentive to report accurately. The buyer can strategically collude with the seller to increase the payment to the seller while reducing the compliance burden of the buyer. If the buyer is liable, however, and there is some risk of detection and subsequent sanction, it may act as a more effective monitor and enforcer.

In contrast to the situation in Annex I trading, buyers in CDM can be good monitors and enforcers with respect to their capacities in monitoring and enforcement and their capacities to manage risks. As partners in CDM joint ventures, Annex I buyers have the ability to directly observe the number of credits created. They, as well as the seller, can employ third party certifiers to monitor the specific project and refuse to pay for invalid credits or sue to improve contract enforcement.

Even where liability could be shared, it might be better to hold the buyer liable instead of the seller. Because international law is weak, it may be better to hold one party primarily liable rather than risk the dilution of sanctions through ambiguity about liability. If both actors can observe and control the outcome, the best way to deter such behavior is to assign liability for misrepresentation, once detected, to that actor with the greatest vulnerability to punishment.

Annex I buyer countries are potentially more subject to reputational damage than the non-Annex I sellers, so they have stronger incentives to enforce domestic regulation. Combining this stronger incentive with stronger domestic regulatory capability in Annex I countries, Annex 1 sub-national buyers of CERs will face a wider array of credible domestic sanctions for noncompliance (including the possibility of citizen suits as well as formal regulatory punishments). In contrast, although seller countries can be punished through restraints on future trading, this may not have much impact before the fact on the behavior of sub-national actors. This conclusion is strengthened by the observation that the buyer is better able than the seller to bear the increased economic risk implied by this penalty system.

Buyers will face high costs when they are held liable in CDM transactions, and this will limit CDM trading. In this case, however, we believe the higher levels of compliance to be achieved would justify the higher costs. As a project participant the buyer is able to control a significant large part of the risk it faces, and many of the trades that will be inhibited would have involved “bad” credits. By holding buyer countries liable, and through them the domestic actors engaged in CDM transactions, the incentive for being honest about credits is increased.

Concluding Remarks

The credibility of traded permits is key in international emission permits markets. Permit markets can exacerbate or alleviate international compliance problems. In trading among Annex I countries, the potential compliance benefits from adding buyer liability to seller liability are outweighed by the high "transaction costs" created and the level of risk buyers would still have to bear. In contrast, for trading with non-Annex I countries through the Clean Development Mechanism, the primary form of liability should be buyer liability. Buyers have considerably stronger incentives to comply do than sellers because they are more vulnerable to punishment and because their governments are able to enforce domestic regulation. Because trades are project-based, sub-national buyers are able to observe and control accurate reporting.

# # #

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In light of the continuing international negotiations over climate change, Resources for the Future (RFF) publishes *Weathervane*, an internet forum dedicated to climate change policy. Just as a traditional weathervane tracks the direction of the wind, *Weathervane* has been tracking developments in climate change policy, both internationally and within the United States, since July 1997.

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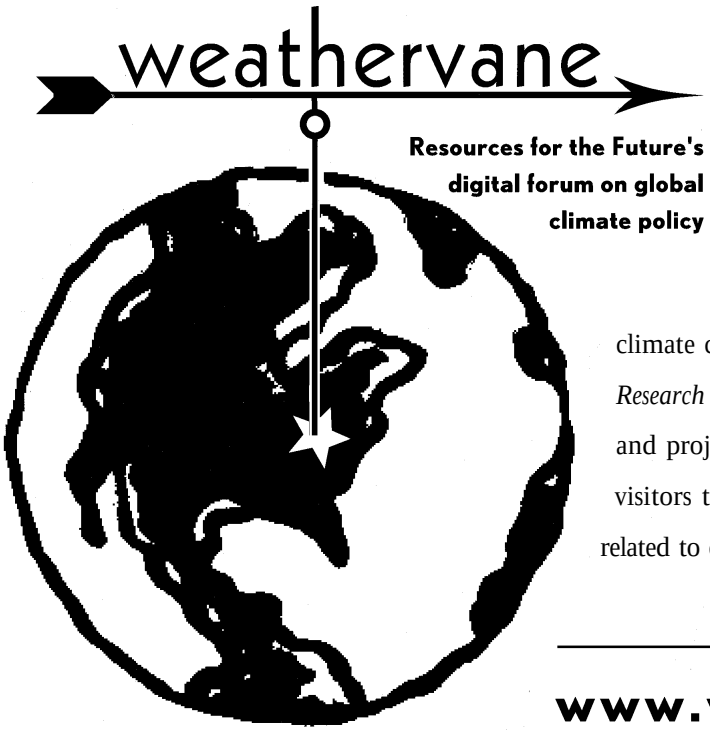

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