

International Emissions Trading and the Clean Development Mechanism

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

Raymond Kopp, Michael Toman, and Marina Cazorla • October 1998

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About the Authors

Raymond Kopp is a senior fellow in the Quality of the Environment division at RFF. His research interests include climate change policy, nonmarket valuation, tax system interactions with environmental policy, and technology and innovation in environmental protection. In 1997, Kopp served on the independent panel that peer-reviewed the draft report on the costs of proposed climate policies compiled by the Clinton Administration's Inter-agency Analytical Team. Contact: *phone* (202) 328-5059; *e-mail* kopp@rff.org.

Michael Toman is a senior fellow at Resources for the Future (RFF) and director of its Energy and Natural Resources Division. His interests include: climate change policy; emission-permit trading; environmental strategies for sustainable development; Central and Eastern Europe; and, energy security. He also coordinates RFF's Climate Economics and Policy Program. Toman has served as a senior economist on the staff member of President Clinton's Council of Economic Advisers (1994-95), advising the staff of the Council on environmental and natural resources policy issues. He has also served as a visiting economist at the Federal Energy Regulatory Commission (1987), and on the faculties of the University of Maryland and Johns Hopkins University. Contact: *phone* (202) 328-5091; *e-mail* toman@rff.org.

Marina Cazorla is a research assistant in RFF's Energy and Natural Resources Division. Contact: *phone* (202) 328-5104; *e-mail* cazorla@rff.org.

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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** (<http://www.weathervane.rff.org>), an internet forum devoted to the discussion and debate of global climate policy.

PART 1:

ANNEX B EMISSIONS TRADING AND “JOINT IMPLEMENTATION”: A PRIMER

Raymond Kopp and Michael Toman

“Emissions trading” is one of the key “flexibility mechanisms” built into the Kyoto Protocol negotiated among 168 governments in December 1997. Supporters of trading argue that it will greatly reduce the overall costs of complying with the reductions in greenhouse gas emissions that the Kyoto Protocol would require. But the rules for a trading system have yet to be worked out, and skeptics question its potential efficacy. The issue is likely to be one of the main subjects at the next international negotiation session on global warming, which begins Nov. 1 in Buenos Aires. In the United States, the Clinton administration has said that it will not send the Kyoto Protocol to the Senate for ratification until, among other conditions, the provisions for trading are explicit.

In addition to technical issues of administration and enforcement, international emissions trading raises substantial economic and political questions. The Clinton administration is using cost estimates implying that the United States intends to buy abroad as much as 85 per cent of the permits it would need to comply with the Kyoto reductions, instead of making those reductions in the American domestic economy. But in the section (Article 17) in which the Kyoto text authorizes trading, it adds that this trading “shall be supplemental to domestic actions.” Some negotiators from other regions, particularly Europe, have questioned whether the American intentions meet the “supplementarity” test of the Kyoto language, and they have proposed limits on the use of international trading that would drive up compliance costs for the US and other countries.

Emissions trading is a mechanism for use among the “Annex B” industrialized countries, basically the OECD (minus South Korea and Mexico) plus the countries of the former Soviet Union and Eastern Europe. All of these countries have numerical emission limits in the Kyoto Protocol to be reached by 2008-2012. Another flexibility mechanism in the Kyoto Protocol, the “Clean Development Mechanism” (CDM), involves transactions between Annex B countries and developing countries that do not have national emission limits. The CDM is discussed in a companion to this paper. Developing countries also could opt into the trading system voluntarily by assuming national limits.

How Would a Trading System Work?

One of the most important tenets of economics has to do with the “gains from trade.” Any exchange of one set of goods and services for another must benefit all parties for the trade to succeed.

To understand the gains from trading emission permits, consider a homeowner who wakes up one morning to find broken water pipes in the bathroom and water gushing all over the floor. The homeowner could stay home and fix the pipes but that would mean losing a day’s pay at work. Instead, the homeowner realizes it is cheaper to pay a professional plumber to fix the pipes and for the homeowner to go to work. In this case, both the homeowner and the plumber can fix the pipes, but the plumber can do it cheaper so both parties benefit if the homeowner pays the plumber.

Trading greenhouse gas emission permits is akin to the plumbing example, in that those buying emission “permits” or “credits” actually are paying someone else to reduce emissions who can do it more cheaply than they can. Internationally, this can occur in a couple of distinct ways. One possibility is that Annex B countries could establish domestic emission trading programs to meet their Kyoto obligations. In the absence of emissions trades among countries, the prices of emission permits could differ. This would mean that the incremental cost of emission control would be higher in the countries with higher permit prices. International trade in the domestic permits of different countries would even out these cost differences, to the benefit of all concerned: those entities able to get lower-priced permits on the international market would have lower compliance costs, and those selling permits internationally would gain more revenue than their own costs of emissions control. Sellers would be acting like the plumber in the example above, providing “emission reduction services” at lower cost than the buyers could achieve on their own.

Even if some Annex B countries do not establish formal emission trading systems domestically, they could still participate in international emission trading. Suppose two countries both establish emissions performance standards for their electricity producers, but the cost of meeting the standards per unit of CO₂ reduction is higher in Country B than in Country A. Electricity producers in Country B could invest in emission-reducing activities in Country A and claim emission reduction credits against which to offset their own costlier-to-reduce emissions. The same kind of transaction could occur if Country A had a low-cost emission performance standards while Country B used a carbon tax with a higher charge per unit of CO₂ than the cost in Country A; in this case, producers in Country B would seek a tax rebate for their emission reduction activities in Country A.

This approach, known as “joint implementation” (JI), is less economically efficient than international trade in domestic GHG permits because it is more costly to identify trading opportunities (markets are harder to organize for heterogeneous projects than homogeneous permits). However, Annex B JI is important to consider since it is unlikely in practice that all or even many Annex B countries will establish domestic GHG trading systems, at least initially. Annex B JI allows cost-reducing international trading to

bridge across an assortment of domestic compliance options. With appropriate domestic investments in GHG monitoring, *investments that would be needed in any case to comply with the Kyoto Protocol*, GHG trading can be an environmentally credible alternative to domestic compliance.

What's So Great About International Emission Trading?

Since emission trading lowers the cost of attaining environmental targets like the Kyoto GHG limits, it avoids the waste of resources. From a political perspective, lower compliance cost makes it politically less difficult to agree to targets.

The cost savings from international GHG trading may be considerable, depending on the amount of gains from trade that the international community allows countries to reap and the organization of the emission reduction markets. Computerized simulation analyses of trading among Annex B countries indicate that under ideal circumstances – no limits on trading volumes and very well-organized markets for emission reductions – the cost savings for the US could be on the order of 50 percent or more. Actual savings are likely to be lower, but the potential still is significant.

A second benefit associated with global emission trading benefit derives from the fact that it separates who pays for emission reductions from who undertakes the reductions. Those countries which find themselves with lower abatement costs and more generous emission ceilings can generate a valuable commodity to export. Emission trading thus can be used to provide financial inducements for participation to those countries that because of lower incomes or other reasons are less eager to join in meeting numerical emission targets. This kind of differentiation was built into the Kyoto Protocol, with Russia and Ukraine even receiving targets in excess of what projected emissions over 2008-2012. In the future, this same approach may lead developing countries to find it advantageous assume national emission limits which provide room for future emissions growth and nearer-term opportunities for emission permit sales to developed countries that generate badly needed investment capital.

What's the Downside?

Many criticisms of emission trading are based on philosophical aversion, misunderstanding of the system, or a confusion of means and ends. Some critics believe that it is improper for a rich country to “buy its way” out of its commitments to reduce GHG emissions by purchasing permits from other countries. Some of the debate over supplementarity seems to be based not on the economics of trading, but rather on these philosophical foundations.

A related concern is that if the richer industrialized countries can “get by” through international permits, they will act too slowly to make the long-term changes in their energy and economic systems necessary for sharper future GHG reductions, such as greater energy conservation and more rapid development and spread of new technologies. Whatever the merits of this view (and the thesis is open to debate), it is ultimately a criticism of the emissions targets set for the Annex B countries rather than a criticism of trading per se.

A third criticism is that the effectiveness of a trading system depends on the enforceability of the cap on emissions within all countries trading permits; to the extent that countries lack the necessary institutions or lack the political will to enforce caps, the trading system becomes a sham. While there is merit to this concern, it is also important to remember that problems of monitoring and enforcement exist even without trading. Trading aggravates the problem only to the extent that “bad” permits (in other words,

permits that actually are needed domestically to cover emissions) are exported by some sellers without detection or subsequent sanction (we come back to this point below). And since trading can lower compliance costs, it also deters cheating.

If a country chooses to purchase permits rather than reduce domestic emissions it loses whatever “ancillary benefits” might emerge from co-control of other harmful air pollutants. For example, if a country puts in place GHG control policies that reduce coal combustion, the policy also can reduce emissions of SO₂, nitrogen oxides and fine particulates – pollutants that cause health problems and ecological damage. If instead GHG emitters bought permits internationally, they would not reduce their coal combustion and local pollutants so much. However, the size of these ancillary benefits is a subject of ongoing debate, especially as policies for the control of these pollutants become tougher. Moreover, the co-control benefits depend critically on the way GHG policy is imposed – for example, if milder CO₂ performance standards were put on older and less efficient coal plants out of political necessity, the ancillary benefits would be reduced.

Another concern is with the large size of the international revenue transfers that might occur from Annex B trading given the Kyoto targets for emissions control. These transfers pose a political problem in that they are likely to flow toward Russia, among other countries, as explained below. They also are may have undesirable economic side effects through their impacts on exchange rates and patterns of trade.

What Issues Loom for COP-4 in Buenos Aires?

Emissions trading among Annex B nations will be just one of many contentious issues discussed at Buenos Aires, but it will be one of the most important. Participants in the allowance trading discussion will have to begin to answer five very difficult questions. How these questions are answered will determine in part how robust and effective a GHG emissions trading program can be and how much the cost of meeting the Kyoto targets can be reduced through international trading. The questions are:

- Who gets to trade?
- What is to be traded, and how?
- How many permits can you buy?
- Who is responsible for the commitments implied in the trade?
- Are we buying environmental improvement or just “hot air?”

Who gets to trade?

Article 17 states, “The Parties included in Annex B may participate in emissions trading for the purposes of fulfilling their commitments under Article 3.” This seems to make it unambiguously clear that governments (Parties) listed in Annex B may trade permits among themselves (intergovernmental trading). However, governments are not the primary emitters of GHGs. To gain the potential cost savings offered by trading, the trading needs to take place among those most able to take advantage of the trades and undertake the emission reductions needed to free up permits for sale (intersource trading). These are private entities, not governments. Who gets to trade matters since it bears on the cost reduction trading can bring forth. The US leans strongly toward private sector trading. A number of European countries see a greater role for intergovernmental trading and prefer other domestic policy tools like a carbon tax (as noted above, this policy approach does not preclude international private sector emissions trading at the project level).

What is traded, and how?

The Kyoto Protocol addresses five other gases in addition to carbon dioxide that have heat-trapping properties in the atmosphere, along with sequestration of carbon dioxide in trees and other “sinks.” Aside from questions about how different gases would be traded off against each other in a trading system, emissions of the other gases and of carbon sequestration are much less well measured than carbon dioxide emissions, which can be inferred from fossil fuel use. Even carbon dioxide inventories are poorly measured in a number of countries, raising questions about how trades would be tracked and recorded and how compliance with the Protocol (with or without trading) would be verified. Finally, the actual institutions for trading (such as brokerage services) must emerge.

How much can you buy?

Article 6 of the Protocol states, “The acquisition of emission reduction units shall be supplemental (emphasis added) to domestic actions for the purposes of meeting commitments under Article 3.” This implies that a Party should undertake some domestic emission reductions and not seek to meet its obligation by simply purchasing the reductions elsewhere. The issue is, how much domestic action is enough?

Who is responsible? — caveat emptor, caveat vendor

For a permit that is sold to be valid it must be surplus to the domestic emissions of the selling country. In the US sulfur trading program the seller is held liable (*caveat vendor*) for the integrity (validity) of the permits sold. If such a seller liability system were put in place for international GHG emissions trading, a country purchasing allowances would not have to worry whether the country selling the allowances actually met its commitment under the protocol. If the selling country did not have permits equal to its emissions, sanctions could be imposed on the seller and the buyer would still be able to use the purchased allowances to offset its emissions. Under such a scheme all permits would be worth the same regardless of who sold them.

In a buyer beware system (*caveat emptor*), default on the part of a seller would make some or all of the permits sold by the defaulting party invalid and not usable to offset emissions in the buyer country. Under a buyer beware system, allowances would have different risks and thus different prices depending on the seller’s reputation. Buyer liability increases the environmental performance of the system by reducing the probability of invalid permits circulating, but it also considerably increases the cost of participating in the trading system. This in turn reduces the incentive to trade and raises the overall cost of compliance. Different countries and stakeholders are taking different positions on this tradeoff between compliance cost and environmental assurance.

Environmental improvement or “hot air”?

In 1990, prior to the break-up of the former Soviet Union (FSU), the emissions of GHG gases by the member states of the FSU were high. After the break-up and the severe decline in economic activity that followed, emissions fell and are today at quite low levels relative to 1990. The Protocol sets the commitments for Russia and Ukraine at 100% of their 1990 emission levels. Projections to 2010 suggest that FSU emissions will still be below 1990 levels by then. This means that these countries could have a considerable block of surplus permits to sell – if they were permitted to do so. This block of allowances has been termed “hot air” by critics, including many in Europe, who are eager that it not be traded on a global basis. The US and some other countries argue that the assigned amounts were agreed upon by all Parties, and therefore that permits based on these amounts are as good as any others for trade. As noted previously, this is as much as debate over the targets themselves as it is over the mechanism.

Further Reading

The full text of the Kyoto Protocol can be found at the website of the United Nations Framework Convention on Climate Change at www.unfccc.de. Some of the following articles and papers on international emissions trading can also be found on the Internet at their respective websites:

Peter Cramtom and Suzi Kerr, *Tradable Carbon Permit Auctions: How and Why to Auction Not Grandfather*, Discussion Paper 98-34, Resources for the Future, May 1998, available at www.rff.org.

Carolyn Fischer, Suzi Kerr and Mike Toman, *Using Emissions Trading to Regulate Greenhouse Gas Emissions: An Overview of Policy Design and Implementation Issues*, Discussion Paper 98-40, Resources for the Future, July 1998, available at www.weathervane.rff.org.

Frank Joshua et al, *Greenhouse Gas Emissions Trading: Defining the Principles, Modalities, Rules and Guidelines for Verification, Reporting & Accountability*, United Nations Conference on Trade and Development, August 1998, available at www.weathervane.rff.org.

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Richard Stewart, Jonathan Wiener and Philippe Sands, *Legal Issues Presented by a Pilot International Greenhouse Gas Trading System*, UNCTAD, New York/Geneva, 1996.

Tom Tietenberg and David Victor, *Combating Global Warming: Possible Rules, Regulations and Administrative Arrangements for a Global Market in CO₂ Emission Entitlements*, Part I, UNCTAD, New York, 1994.

Jonathan Baert Wiener, *Designing Markets for International Greenhouse Gas Control*, Climate Issues Brief No. 6, Resources for the Future, September 1997, available at www.weathervane.rff.org.

PART 2:

THE CLEAN DEVELOPMENT MECHANISM: A PRIMER

Michael Toman and Marina Cazorla

Introduction

The Clean Development Mechanism (CDM) is one of several “flexibility mechanisms” authorized in the December 1997 Kyoto Protocol to the 1992 United Nations Framework Convention on Climate Change (signed at the Rio de Janeiro “Earth Summit”). The Kyoto Protocol specified legally binding commitments by most industrialized countries to reduce their collective greenhouse gas (GHG) emissions by at least 5% compared to 1990 levels by the period 2008-2012. With the goal of reaching these targets at the lowest possible cost for countries that committed to reductions, the Protocol created two flexibility mechanisms, GHG emissions trading and CDM. The CDM is also intended to be an opportunity for developing countries that did not accept binding emissions reductions at Kyoto to be involved in GHG mitigation.

The second section of this paper introduces the CDM’s purpose, mandate and institutional structure as authorized in the Kyoto Protocol. The third section focuses on the principal technical and administrative issues that will arise as the CDM is designed and implemented. The last section discusses some of the main unresolved issues with the CDM that confront the Conference of Parties to the Framework Convention.

The Kyoto Protocol and Article 12: Organization and Purpose of the CDM

The CDM was created as a successor to “Joint Implementation” (JI). JI consists of a bilateral agreement between two entities to complete a GHG mitigation project. The investor is from an “Annex B” industrialized country that must reduce its emissions under the Framework Convention. JI potentially can provide credit for emissions abatement to the investor at a lower cost than domestic abatement. In other words, JI is a form of “emissions trading.” At the same time, a developing country host can benefit from new investment that increases economic productivity and may reduce local environmental problems. Under the Kyoto Protocol, JI projects still can be undertaken between entities in Annex B industrialized countries (as specified in Articles 3 and 4). However, collaborative projects to reduce emissions or sequester carbon in developing countries are now to occur through the CDM.

Article 12 of the Kyoto Protocol identifies three specific goals for the CDM: (1) to assist in the achievement of sustainable development, (2) to contribute to the attainment of the environmental goals of the Framework Convention, and (3) to assist Annex B parties in complying with their emissions reduction commitments. In particular, Article 12 specifies that developing countries are to benefit from CDM projects resulting in “certified emission reductions” (CERs) and that industrialized countries may use CERs to comply with their quantified emissions reduction commitments under the Kyoto Protocol. Essentially, this allows for voluntary projects similar to previous JI projects between Annex B and non-Annex B countries. The difference is that unlike previous JI projects, CERs are specifically authorized to apply to Annex B emissions reduction targets.

Article 12 establishes three bodies to oversee the CDM: the representatives of the Conference of Parties (COP), an executive board established by the COP, and independent auditors to verify project activities. However, the Protocol provides almost no guidance on what exactly the CDM would do or how it would operate. Instead, the structure and authority of supervisory bodies and the CDM are left for future negotiation.

CDM Design Issues

In order for CERs to be created from CDM projects, a number of overlapping technical, regulatory, project finance and administrative functions must be performed. Before any CDM project can be established, there must be demand for CDM projects and CERs; developing countries' concerns about uneven bargaining positions during project contract negotiations must be addressed; liability must be assigned, and insurance procured; project financing also must be obtained; and the benefits of projects must be allocated among participants. It is important to bear in mind that the CDM is a form of *market*, one in which valuable goods and services are to be bought and sold. Many of these functions may be most effectively undertaken by private markets or existing international institutions; the key question is what functions need to be undertaken by new CDM institutions.

Criteria for selection of projects. CDM projects must presumably fulfill certain criteria in order to be certified upon completion, but these criteria have not yet been established. Possible criteria include: method or extent of technology transfer; specific performance or design standards for transferred technology; capacity and willingness of both national and local governments to host the project; existence and nature of agreements for sharing project benefits (CERs and financial returns) and project liability between investor and host; and limits on local environmental or other social impacts. A particularly important question is what criteria might be established for determining “sustainable development” and other benefits for host countries. Another important question is whether references to “emission reductions” in Article 12 are interpreted as allowing or precluding carbon sequestration projects under the CDM.

Project review and CER calculation (before implementation). Prior to the initiation of projects, the “baseline” or previous amount of carbon emissions from the project facility or area in question must be established. The baseline is used to show that purported GHG reductions are “additional” to what otherwise would have occurred. One practical question that arises in assessing additionality is the issue of “project leakage” – when a particular project lowers emissions, but emissions rise in other parts of the host country economy (or elsewhere). This could happen, for example, if a reforestation project in one location was accompanied by greater deforestation elsewhere. There are a variety of options for defining project-level baselines to assess additionality. These include detailed project-level review of projected emissions with and without the project, and streamlined formula-based approaches that estimate emission reductions based on easily observed project characteristics (for example, conversion of a coal power plant to natural gas). Another approach would involve the host country establishing and enforcing “top-down” national or sectoral baselines in an effort to limit leakage, and then assigning shares of the baseline to different emission sources much as emission allowances are allocated in the US program for sulfur dioxide trading among power plants. In this case the validity of the CERs generated from a specific project would depend in part on overall sectoral emissions.

Project monitoring and CER assessment (after implementation). Related to the issue of additionality are technical questions regarding how to measure, monitor and verify the outcomes of individual projects. Both emission reduction and carbon sequestration projects pose their own measurement and monitoring challenges. In either case, some independent entity must intermittently monitor the emissions or sequestration of the project in order to ensure that the benefits of the project accrue over time as represented by project participants. In turn, standards for the accreditation of the certifiers are needed in order to ensure certifier objectivity and credibility.

Rules for CER validity and project liability. For CERs to be credible, there must be rules defining when CERs can be used and assigning legal responsibility in the event that a CDM project is found not to generate the amount of emission reduction promised (either because of misrepresentation before the fact or less than expected performance after the fact). Liability is of less concern if CERs can be used only after an independent (and honest) auditor has certified their existence. If this were the case, prospective credits would be held in abeyance between certifications; the project participants would have to trade off the value of more rapid certification against the cost. If, however, credits can be used in advance of certification, as is the case in some US emission credit trading programs, then questions of after-the-fact liability do arise. Under the Kyoto Protocol, Annex B countries have ultimate responsibility for noncompliance if credits are disallowed. In practice, the assignment of liability to Annex B investors/CER buyers is likely to be efficient since buyers have a financial and reputational stake in CDM projects, possess the resources for effective project oversight, and face enforceable emission ceilings in their own countries. CERs could be transferred to subsequent purchasers without reassignment of liability in order to protect incentives for trading.

Marketing, information, financing, and insurance services. If the CER market is designed reasonably well, most prospective investors are likely have access to market financing for well-designed CDM projects. In some cases, however, institutions like the World Bank might need to provide assistance in identifying and providing financing. Insurance against project failure is another important financial or brokerage service, which again could be provided by the private sector or in some cases by multilateral institutions. Finally, market institutions need to be developed for facilitating transactions in CERs as well as “derivative” transactions, such as options to buy or sell CERs in the future. These institutions would serve as a clearinghouse for secondary trades by matching buyers and sellers, and could also be a repository for “banked” or unused CERs. Such institutions would also facilitate exchanges between CERs and emission permits emerging from Annex B trading.

Providing negotiating support for non-Annex B countries. Some developing countries might avoid participation in CDM projects out of fear of possible exploitation by investors due to lack of capacity to negotiate fair contracts. These countries are concerned about the relationship between the CDM and international development assistance, the under-development of the private sector in some developing countries, the lack of developing country capacity to monitor and verify projects independently, and the possibility that investors will take advantage of their lack of technical expertise in project evaluation. The CDM or other institutions could assist by providing access to experienced negotiators and offering training or capacity-building services. However, undertaking these tasks requires a resolution of potential conflicts of interest among the roles of project promoter, host country advocate, and neutral market supporter.

Recording of CER exchanges and resulting changes in Annex B parties' accounts. Some institution must be responsible for accounting for newly created CERs, CER exchanges or transactions, and the application of CER credits to Annex B parties' GHG emissions obligations.

CDM fund administration. Article 12 stipulates that “a share of proceeds from certified project activities [should be] used to cover administrative expenses as well as to assist developing country Parties that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation.” The COP must still determine how funds will be drawn from CDM projects or CER trading, how large the fund should be, and how proceeds would be disbursed. The question of how funds are raised is of particular interest. If the funding mechanism is based on the proceeds of the project (either direct financial payment or diversion of a share of CERs to a central fund), then in negotiation investors will reduce their willingness to provide benefits to the host country accordingly in order to ensure that the net return on the project remains commensurate with other rates of return throughout the global capital

market. In this case the CDM fund would simply be redistributing proceeds among non-Annex B countries. An alternative would be to levy a fixed annual registration fee on any investor interested in being eligible for participation in the CDM.

Key Decisions on CDM Structure and Function

There are several ways the CDM could be structured to address project selection, finance and implementation. The CDM could be more centralized and active in CER market operation, playing a role similar to that of the World Bank or the Global Environment Facility (GEF) in screening, selecting, financing, and assisting in implementation of projects. The CDM also could be a market maker, seeking out host countries from whom to acquire credits and reselling them. However, a key question with a more centralized alternative is the extent to which the CDM would have a comparative advantage in carrying out all these functions, especially if by international agreement it became the only entity eligible to carry out these various functions. Experience suggests that many of the functions enumerated above can be carried out more efficiently by the private sector, and that exclusive control over the functioning of a market does not promote market efficiency or adaptability.

Another alternative would be very similar to Joint Implementation, in which an industrialized country and a developing country agree to collaborate on a CDM project which is later certified by an independent auditor. This arrangement would imply a much smaller role for the CDM, one mostly involving definition of basic criteria for project selection and implementation, general oversight of audits and recording of CER exchanges. This system likely is the most dynamic and flexible, with individual actors in the market (investors, financiers, and others) defining the functioning of the CER market through “learning by doing.” How successful this approach would be in terms of accountability would depend on the criteria used for project selection and implementation and the quality of oversight applied. There is a broad debate over the issue of “supplementarity.” The Kyoto Protocol refers to the use of international emissions trading (and by extension the CDM) as being “supplemental” to domestic actions. Supplementarity constraints reflect a concern by some Annex B countries that participation in international flexibility mechanisms will limit the scope and stringency of domestic policies, thus retarding the long-term development of technology and improved energy efficiency needed to achieve and go beyond the Kyoto goals. The other side of that argument is that limits on trading and CDM are blunt instruments to improve the credibility of a nation’s commitment to the Kyoto Protocol, and that by increasing the overall cost of compliance with the Protocol the restrictions also contribute to lack of willingness to achieve the target reductions.

Finally, there are inherent tensions among the goals for the CDM articulated in Article 12 of the Kyoto Protocol. For example, a more formulaic approach to project review would lower “transactions costs,” but it might also decrease the accuracy of the assessment of additionality. Greater efforts to extract benefits for non-Annex B countries or to reduce uncertainty in the measurement of CERs will increase participation costs for Annex B countries and thereby reduce their interest in participation. To illustrate, requiring selection of the best available abatement technologies might facilitate technological “leapfrogging” by LDCs but would also raise the cost of the project. These tradeoffs and their consequences are the reason why the design of CDM institutions and projects must be considered carefully before implementation. Since early (pre-2008) reductions through the CDM are possible under the Protocol starting in 2000, there is little time to spare in settling some of these basic issues.

Further Readings

For the full text of the Kyoto Protocol and Article 12, see the website of the United Nations Framework Convention on Climate Change at www.unfccc.de. The majority of the following articles and papers on the Clean Development Mechanism can also be found on the Internet at their respective websites:

Center for Clean Air Policy, *Setting Priorities for the Implementation of the Kyoto Agreement: Making Flexibility Mechanisms Work*, February 1998, available at www.ccap.org.

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Looking for an honest broker for climate change policy?

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.

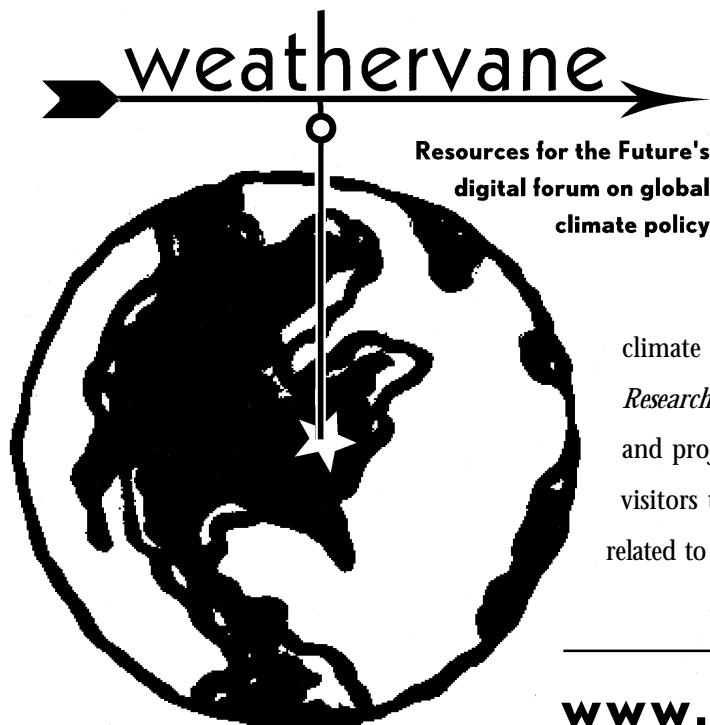
Our editorial aim is to present balanced and objective information, with no one perspective or viewpoint dominating our analysis and reporting. Now with an eye on the Fourth Conference of Parties, to be held in Buenos Aires, Argentina in November 1998, and the stakes potentially enormous on all sides of this complicated issue, *Weathervane* continues to provide a neutral forum for careful analysis to complement the political calculations that so often drive decisions.

Regular site features include:

Perspectives on Policy, an opinion forum for invited players in the climate policy debate. It gives experts from every corner — business, government, environmental groups, and academia — an opportunity to weigh in with their opinions on a selected topic; *By The*

Numbers, a regular column by RFF's Raymond Kopp to help decode and demystify energy and environmental data and create a better understanding of the link between economic data and policy formulation; *Enroute to Buenos Aires*, which tracks developments in global

climate change policy and players in the debate; *Research Spotlight*, which reports new climate findings and projects; and *Sounding Off*, an open forum for site visitors to voice their opinions on a variety of topics related to climate change.



Resources for the Future's
digital forum on global
climate policy

www.weathervane.rff.org