

## DESIGNING THE CLEAN DEVELOPMENT MECHANISM TO MEET THE NEEDS OF A BROAD RANGE OF INTERESTS

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*International climate change negotiations are struggling over the basic design and features of the Clean Development Mechanism (CDM), established in the 1997 Kyoto Protocol to the Framework Convention on Climate Change. Parties and observers advance three possible implementation models, or architectures, for the CDM—bilateral, multilateral, or unilateral. These approaches differ in fundamental ways, reflecting preferences for the way CDM investment should take place. Choosing one approach over another will invariably enable some countries to benefit more than others and favor certain project types. Because of this, some Parties advocate the use of only the approach that best serves their particular national circumstances.*

*This Climate Note examines the characteristics of the different designs advanced by governments and observers, exploring how an “open architecture” CDM might operate. An open architecture would allow different designs to complement one another, enabling the CDM to deliver a broader set of climate and sustainable development benefits. This approach reconciles the apparently conflicting visions of the CDM and*

*could help forge a consensus in the climate talks. Without an open architecture, consensus could prove elusive and the CDM will struggle to satisfy its high expectations and the diverse interests of the Protocol Parties.*

### I. INTRODUCTION

The Clean Development Mechanism, established in the Kyoto Protocol to the Climate Change Convention, promotes investment in projects that both reduce greenhouse gas emissions and foster sustainable development in developing countries.<sup>1</sup> CDM projects hosted by developing (non-Annex I) countries are expected to earn certified emission reductions (CERs, or credits) that industrialized (Annex I) countries may use to help comply with future emission reduction obligations under the Kyoto Protocol.

The CDM has attracted more attention and raised greater expectations than any other provision of the Kyoto Protocol, in particular because it is the main element of the treaty that bridges the divide between the developing and industrialized worlds. Industrialized countries see the CDM as a potential source of low-cost emis-

sion credits, while developing countries hope it may attract new and additional investment to foster more rapid and more sustainable development. The CDM has further attracted the interest of the private sector, in industrialized and developing countries alike. Unlike other financial mechanisms created by treaties or international organizations, the CDM is expected to generate financing primarily from private rather than government sources.<sup>2</sup>

If designed properly, the CDM could help propel developing countries onto cleaner development paths, change patterns of private investment, and achieve real reductions in greenhouse gas emissions, thereby helping to prevent dangerous climate change.

However, substantial disagreement among Parties and interested observers persists, on even the most fundamental design features of the CDM. This is not surprising. The CDM’s design will largely shape the type of projects that take place, the geographic distribution of those projects, the overall size of the CDM, the power dynamics within individual project negotiations, and the overall attractiveness of the mechanism relative to other abatement options available to countries.



This *Climate Note* describes and analyzes the principal CDM design models, indicating which model best fits the interests of the various stakeholders. Although these approaches are often presented as mutually exclusive, they could be combined to operate in parallel through an open architecture. An open architecture would encourage experimentation and learning-by-doing. It is more likely to deliver the set of objectives deemed important to many Parties: broad participation by host governments and investors; viability of small-scale projects; capacity building; and investor appeal. The mechanism should aim to promote sustainable development in a broad range of countries. This objective is particu-

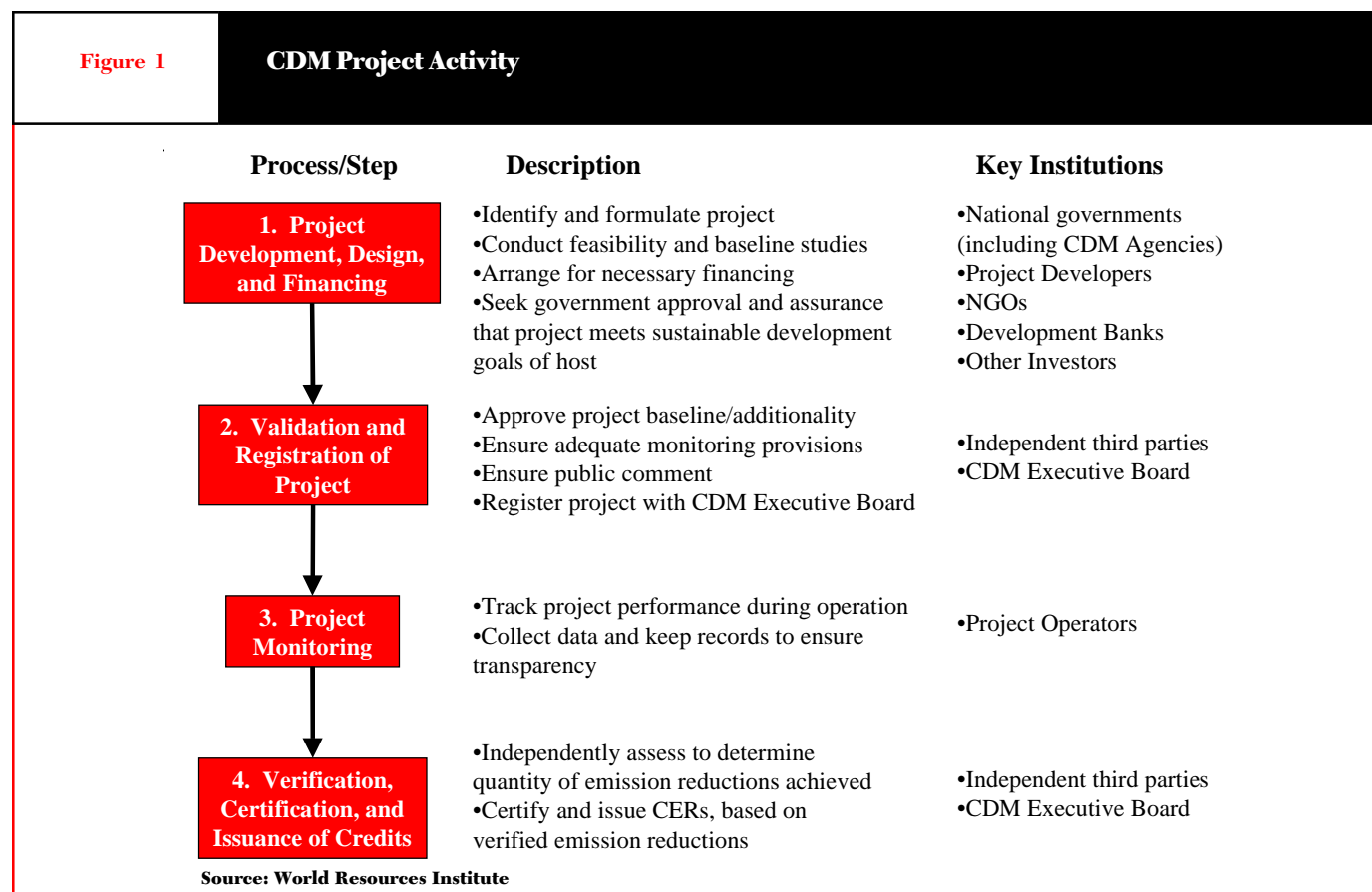
larly important since the CDM will require continuous political support from the world's governments through the Kyoto Protocol.

There are a number of ways in which the Parties can promote an open architecture CDM that best delivers on the mechanism's extremely high expectations. The CDM's Executive Board, established by the Kyoto Protocol to supervise the mechanism, is one such vehicle. In addition to ensuring the environmental soundness of the CDM, the Parties could create an Executive Board that assists in arranging project financing, while promoting wider geographic participation. Towards these same ends, Protocol Parties should elaborate the

rules for government participation in order to direct CDM activities toward countries that do not attract private investment.

## II. THE PROJECT CYCLE AND CORE REGULATORY STANDARDS OF THE CDM

Clean Development Mechanism projects pass through a set of common stages, beginning with the initial project idea, then flowing through implementation, and ending with periodic certification of emission reductions. The general steps within this project cycle are explained in Figure 1.<sup>3</sup> Participation in the different stages of the cycle could involve a wide range of actors,



including those from industrialized and developing countries, and international financial and developmental institutions.

Step 1 of the project cycle entails project *development, design, and financing* arrangements. The project developer will conduct feasibility and baseline studies, and obtain government approval for the project.

The subsequent steps shown in Figure 1—project validation, monitoring, and verification/certification—are the core regulatory requirements that are envisioned in the Kyoto Protocol and will be further articulated by the Protocol Parties. All CDM projects must be subject to this common set of core regulations to generate certified emission reductions in which participants and stakeholders can have confidence. First, before the project is implemented, it must be *validated* to ensure that the project meets all requirements for CDM projects decided by the Parties. Next, during implementation, project participants must *monitor* the performance of the project in a transparent and verifiable fashion. Finally, to generate credits through the CDM, all projects must have their claimed emission reductions independently *verified*.

Thus, steps 2, 3 and 4 in Figure 1 will involve regulatory standards and oversight, as well as participation of independent third parties and the Executive Board of the CDM. The execution of these steps will further depend upon standardizing well-known and challenging implementation requirements, such as developing a project baseline from which to

determine the amount of emissions reduced by the project. These core regulatory requirements will form the basis of the environmental integrity of the mechanism, and by extension, the credibility of the market for CERs.

Although steps 2, 3 and 4 should be standardized, the project development and financing components of a CDM project—shown together in step 1 of the project cycle—could involve considerably more flexibility and include a variety of actors and institutions. Project development and financing are the main variables in the CDM design models advanced by countries and observers. These models reflect different basic conceptions of what the CDM is and how it should work. The bilateral, multilateral, and unilateral models, described in the following section, vary principally with respect to the following: (1) the relationship between the Annex I investor (the ultimate destination of most CERs) and the project design and financing; (2) host country capacity requirements; (3) the degree of centralization in project selection; and (4) the distribution of project benefits.

### III. ONE MECHANISM, MANY MODELS

Figures 2, 3 and 4 map three alternative visions of the CDM: bilateral, multilateral, and unilateral.<sup>4</sup> These three figures illustrate the general flow of financing and CERs, as well as the institutional roles of various CDM participants within the project

cycle. The bilateral, multilateral, and unilateral models are presented in their “pure” form, as if each would be the exclusive shape of the CDM. A fourth and possibly more realistic model for the CDM is shown in Figure 5. This model shows the CDM

*CDM models reflect different basic conceptions about what the CDM is and how it should work.*

as a hybrid instrument through which a developing country could combine different elements of bilateral, multilateral, and unilateral approaches. Finally, an open architecture CDM envisions all of the design models coexisting and operating in parallel, so that countries with different requirements and circumstances can find the CDM accessible and conducive to their needs.

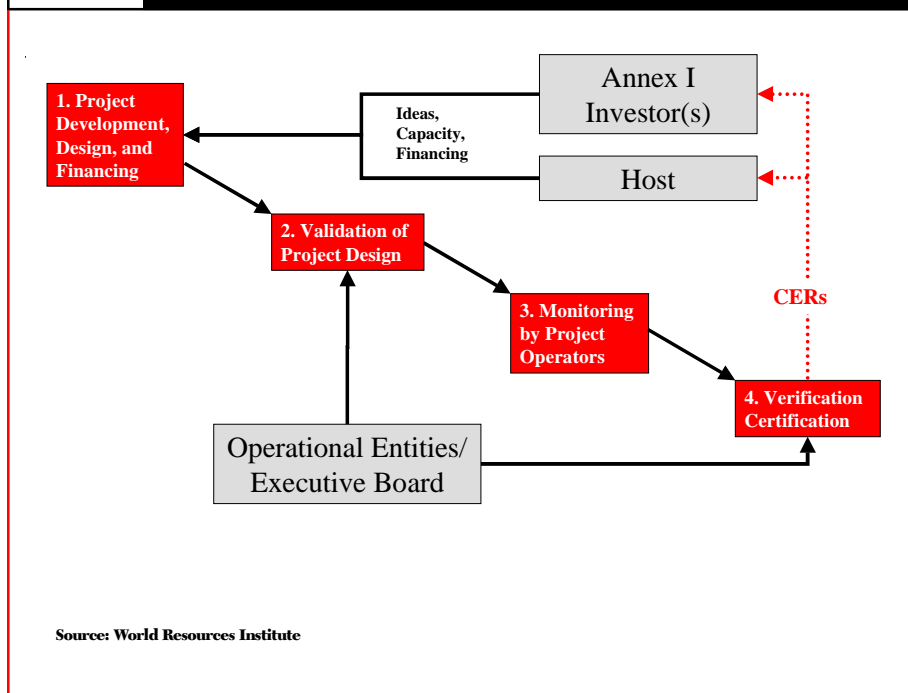
#### Bilateral CDM

The model that involves the least new institutional machinery is usually referred to as the bilateral model. (See Figure 2.) The bilateral model casts one or more Annex I investors as direct participants in the development, financing, and, possibly, operation of a CDM project. In this decentralized structure, the project selection, financing, and sharing of credits (and any pricing agreement) are worked out directly between interested parties (developers, investors, and governments) on a project-by-project basis. This is essentially the model that has been followed in almost all Activities Implemented Jointly (AIJ) projects to date.



Figure 2

**Bilateral CDM**



ing, and negotiating project agreements on an individual basis, particularly in the AIJ pilot phase. If these transaction costs continue in the CDM, the bilateral approach is likely to favor large capital-intensive infrastructure projects. In contrast, small-scale efforts, such as renewable energy projects, may be burdened disproportionately and rendered non-competitive.

**Multilateral CDM**

A multilateral model is analogous to a mutual fund of CDM projects, and is, therefore, often referred to as a “portfolio” or “fund” approach. Financial resources flow from Annex I investors through a centralized investment fund and are channeled toward project activities in host developing countries. (See Figure 3.) Thus, there is a clear separation between Annex I investors, on the one hand, and project development and financing on the other. The fund would undertake CDM project development itself, in cooperation with developing country investors and possibly the host country CDM office. Depending upon its characteristics and capacities, the fund could provide financial assistance or technical services in the project design stage. This could include the baseline study or contracting arrangements for independent verifiers. Once emission reductions from project activities are certified, credits would be sold or issued through a centralized body to the investors. Investors would receive a share of (or the purchase rights to) the CERs proportional to their capital contributions to the fund. Generally, a fund would centralize a set

The private sector, many industrialized countries, and some large developing countries champion a bilateral approach. Bilateral CDM is the most consistent with conventional modes of foreign direct investment (FDI) and provides the most flexibility to project developers. This approach would be attractive to a variety of Annex I investors, such as multinational corporations striving to achieve additional emission reductions within developing country facilities or firms specializing in the deployment of a particular low-carbon or renewable technology. This approach is also consistent with development assistance practices, as many AIJ projects evolved out of existing cooperative aid programs between governments. Thus, governments may seek to advance bilaterally implemented CDM projects through existing aid programs.

However, the bilateral model raises a few important concerns, particularly from some developing countries. A large majority of FDI between industrialized and developing countries is concentrated in a small set of countries, with China, Mexico and Brazil receiving over 50 percent of the total investment.<sup>5</sup> Given the pattern of FDI flows, it is unlikely that a strictly bilateral CDM would deliver a geographic distribution of projects that is acceptable to all Protocol Parties. Because of the decentralized nature of the bilateral approach, there is equally little assurance that developing countries will attract investments in priority projects and sectors.

There are other more generic concerns with the bilateral CDM. Many observers have identified the extremely high transaction costs of identifying, financ-

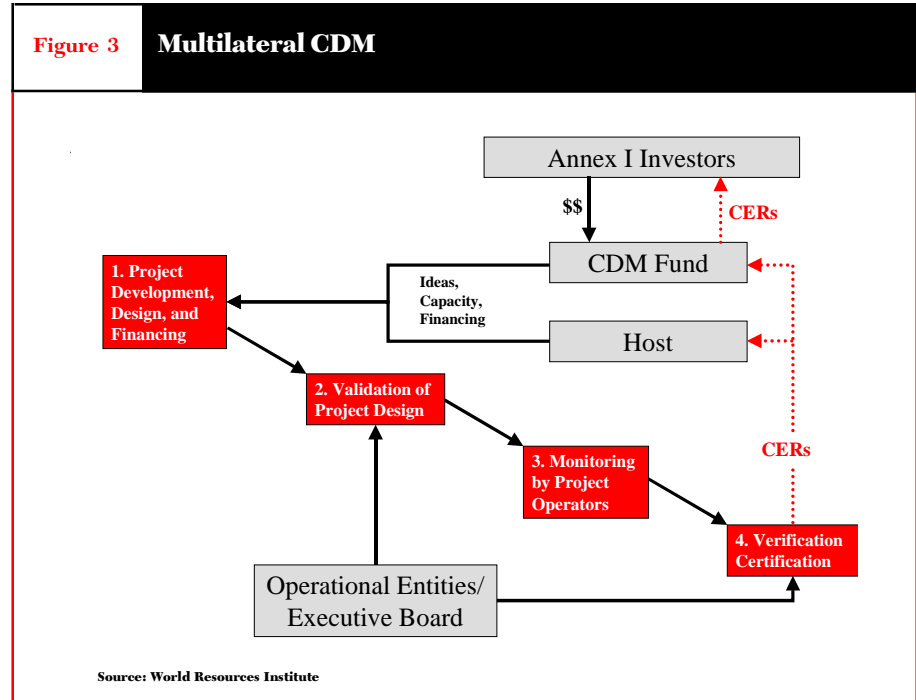


of important decisions, including which projects actually receive funding and the arrangements for project validation and verification services.

The disproportionate capacity of industrialized countries to undertake the financial, engineering, and legal analysis needed for developing CDM projects could translate into a significant power imbalance during project negotiations, leading to unfair and inefficient outcomes. For the CDM market to operate efficiently, Parties to the Protocol must have roughly equal capacity and power when settling the terms for risk sharing, credit sharing, or CER purchase prices. Multilateral approaches could in some instances give developing countries increased bargaining power in these areas. Instead of dealing with an Annex I country corporation directly, the host country may be negotiating with a fund manager whose mandate is more compatible with its interests, such as a regional development bank or a fund that specializes in a specific technology.

Since decisions regarding location and type of project are not subject solely to the vagaries of the market, a multilateral design is also appealing to countries that believe they will be overlooked by the CDM (e.g., least developed countries).

Finally, because the multilateral approach is portfolio-based, it could help shield investors from the risks of individual project failure. Just as personal investors may feel more secure owning a share in a mutual fund that purchases a portfolio of stocks rather than an individual stock, CDM investors may wish to diversify their



risk among a portfolio of projects. Portfolio approaches may also defray transaction costs by pooling technical skills for developing baselines and monitoring plans.

While the multilateral model is analogous to a mutual fund, a further issue is how many funds might coexist simultaneously. Thus, we find two substantially different conceptions of the multilateral model described above and depicted in Figure 3: a *single-supplier* or a *multiple funds* arrangement.

**Single-Supplier Arrangement.** A single-supplier model consists of a *sole* CDM multilateral fund, serving as a centralized market-maker.<sup>6</sup> Credits disbursed from a centralized entity would be the only primary market for CERs. The CDM Executive Board or other officially designated body would select projects and decide upon resource allocation.

A single-supplier model might give developing countries the greatest control over CDM investment flows within their borders, depending upon how responsive the multilateral fund is to national priorities. Similarly, it might be conducive to broad geographic distribution of projects, because resource allocation decisions would be made outside the boundaries of the market.

There are substantial drawbacks to this approach. Relying on a single centralized instrument could slow the market development of the CDM and create large inefficiencies. Capitalizing such a fund—a prerequisite to its operation—is also certain to be challenging, because contributing to the fund might only appeal to a limited segment of potential CDM investors, mainly governments. All things considered, the purposeful creation of a highly centralized, monopolistic CDM could work to



the disadvantage of investors and host countries alike, and is largely inconsistent with the private investment orientation of most CDM proponents.

**Multiple Funds Arrangement.** A multilateral CDM need not be entirely centralized. This second conception of the multilateral model lessens some of the shortcomings of a single-supplier approach. In this situation, a variety of institutions operate many competing and co-existing CDM funds. Early examples of such funds include the World Bank's Prototype Carbon Fund and other initiatives shown in Table 1. Under this model, multiple CDM funds would have their own "prospectuses," mandates, and governance systems. Managers of the individual CDM

funds would make project selection and financing decisions consistent with both the fund's principles and internationally agreed CDM criteria. As exemplified in Table 1, different funds might offer regional or project specialization, and could assist in project financing through equity, debt, or grant-based financing. Regional development banks, industry associations, nongovernmental organizations (NGOs), private sector entities, governments, or other financial institutions could initiate and administer CDM funds.

#### **Unilateral CDM**

The defining feature of unilateral CDM is the absence of an Annex I entity in the development, financing, and implementation of a

project.<sup>7</sup> (See Figure 4.) This model places project development and finance, as well as its associated risks, entirely in the realm of the host country. Non-annex countries would be free to develop and fund domestic activities that lead to additional emission reductions. Like any project, one financed through the unilateral model would need to have an independent third party approve the project design, including the baseline, as well as certify the claimed emission reductions. Once certified, credits would accrue directly to the host country, who could, in turn, sell all or part of the CERs to interested Annex I corporations or governments. Prices would either be negotiated directly between buyer and seller, brokered by a third party,

**Table 1**

**Existing or Planned Greenhouse Gas Funds**

<b>Fund Name</b>	<b>Investment Focus</b>	<b>Fund Manager</b>	<b>Current or Prospective Sources of Capital</b>	<b>Size (\$US m.)</b>
Prototype Carbon Fund	Many project types and countries	Development Bank (World Bank Group)	Governments, Multi-national Corporations	\$150
Dexia-FondElec Energy Efficiency and Emission Reduction Fund	Energy efficiency; Central and Eastern Europe	Investment Company (FondElec Group)	EBRD; The Dexia Group; other	\$150
D&B Capital's Clean Energy Fund	Restructure existing power generation facilities	Investment Company (CEMCO)	Large emitting corporations; financial institutions	\$100
UtiliTree Carbon Company	Forest projects; U.S. and international	Industry Association (members of Edison Electric Institute)	U.S. electric utility companies	\$2.4
Credit Lyonnais – Arthur Andersen	Energy infrastructure; developing countries	—	—	\$400

**Sources:** See "New Funds Eye Carbon Credits," in *Environmental Finance*, March 2000; "Credit Lyonnais Eyes Carbon Fund," in *Environmental Finance*, April 2000; the Prototype Carbon Fund, <http://www.prototypecarbonfund.org/>; and Edison Electric Institute, <http://www.eei.org/issues/enviro/manus.htm>.

**Notes:** Not all funds listed above are fully capitalized. There are many other investment funds that could support projects that reduce greenhouse gas emissions. The funds above, however, each specifically aim to generate offsets from projects.

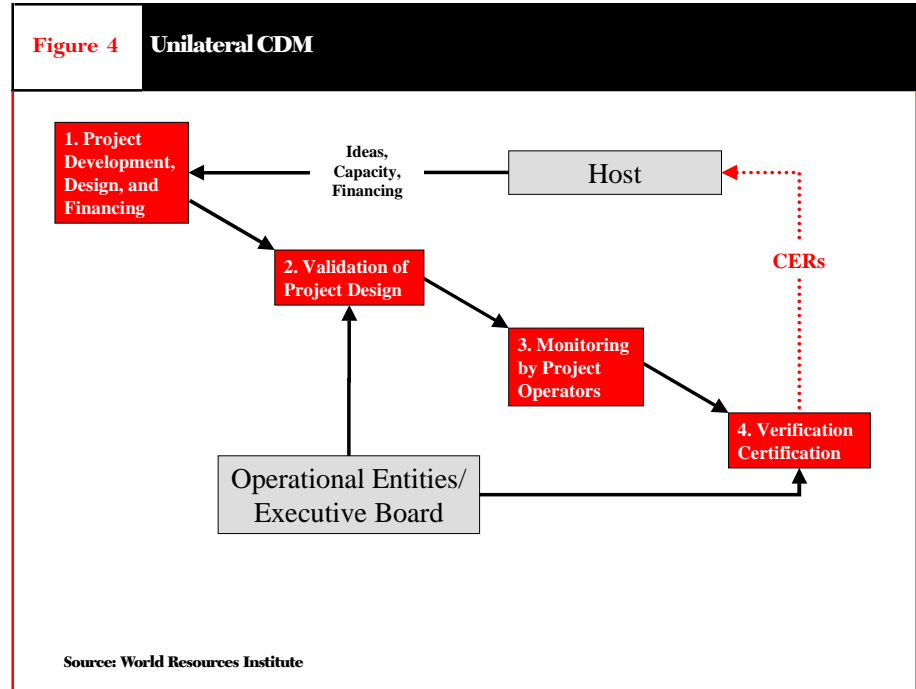


or set through an auction that might be run under the supervision of the CDM Executive Board. (See discussion below.)

Generally, unilateral CDM is attractive to countries with sufficient capacity and resources to select, develop, finance, and operate sustainable development projects that reduce additional greenhouse gases.<sup>8</sup> Unilateral CDM could help ensure that projects are closely knit with national sustainable development plans. Some developing countries are concerned that they will serve merely as a vessel for emission reductions projects that are cheapest and most attractive to the industrialized countries, irrespective of their own development considerations. Having developing countries take ownership through a unilateral CDM addresses these concerns.

In addition, the unilateral model can promote wider CDM participation. Some countries with CDM aspirations, such as Colombia, may be unable to attract any bilateral and portfolio investment because of unacceptably high country risk.<sup>9</sup> A unilateral model could enable some countries that are high risk, but which also have a political commitment to address climate change and promote sustainable development, to benefit from CDM projects.

This model is not conducive to countries that are in need of up-front capital for implementing projects or that lack project development and implementation capacities. Lack of access to capital is a frequent barrier to project implementation. Similarly, although numerous international capacity build-



ing initiatives are already underway to help create capable national CDM institutions and build a pipeline of viable projects, it is not likely that such assistance will sufficiently extend to all interested countries, particularly in the early stages of the CDM market.<sup>10</sup> While this model would allow a developing country to capture all of the project benefits, the host would similarly bear all of the risks and costs inherent in project development, financing, monitoring, and third party certification. Finally, the unilateral model raises the need to explicitly delineate what constitutes a “CDM project,” although project boundaries should be addressed regardless of the CDM architecture adopted. (See Box 1.)

### Hybrid CDM

Various features of the above models may be combined in a single hybrid instrument. Figure 5 shows a domestically oriented CDM fund, which

combines important elements of the unilateral and multilateral models (see page 10). This hybrid provides the ownership advantage of the unilateral model, in that all project selection and development occurs through domestic institutions. CDM investment funds, which could come from domestic or international sources, finance a portfolio of projects through a centralized mechanism, giving this approach an equally strong multilateral flavor.

Costa Rica, Mexico, and other countries have already expressed interest, or experimented with, domestic revolving funds that would support small-scale CDM projects.<sup>11</sup> These funds would be replenished with the subsequent sale of CERs. The approach is generally consistent with many existing and planned national environmental funds—promising institutions for the unilateral or hybrid



The Kyoto Protocol refers to *certified projects activities* under the CDM, but does not specifically define what constitutes a project. Unilateral CDM draws attention to the need to define project boundaries, although this subject should be addressed regardless of the CDM architecture adopted.

Some conceptions of a project activity may include *broad categories* of measures, such as carbon taxes, removal of subsidies, forest preservation laws, or other domestic regulations. This could allow countries to claim credits through the unilateral approach for any number of policies that reduce greenhouse gas emissions. Crediting these kinds of policy-based measures could potentially generate an enormous quantity of credits, collapsing the market price of CERs and creating the harmful incentive for developing countries to take no common sense emission reduction actions *unless* they are credited through the CDM.

Although policies-as-projects are most apparent under unilateral CDM, they could emerge under any of the CDM

models. Development banks could, under a multilateral model, seek CDM credits for structural adjustment loans that require policy changes such as subsidy removal, market pricing of fuel and electricity, among others. Under a bilateral model of the CDM, an Annex I government could try to claim CDM credits for forest or transportation policy reform packages in developing countries.

Such policy reforms are laudable and indeed may be necessary preconditions for a more conventional and bounded notion of a project to be successful. Realistically, however, crediting climate-friendly domestic policies, such as carbon taxes or deregulation, should fail either the *measurable* or *additional* existing requirements of the CDM. Because of economic, health, and other benefits, many developing countries are already implementing climate-friendly policies, even without earning credits.<sup>1</sup> Furthermore, the larger the project boundaries (e.g., entire economy or even international), the more uncertain emission reduction measurements become. If additionality and other standards cannot ensure that policy projects are ineligible, Parties could require a project to have discrete boundaries (i.e., confined to a particular tech-

nology or limited geographic area) for project validation or explicitly define what constitutes a project activity, rather than limit the CDM to either the multilateral or bilateral models.

Ideally, however, methodological and other project criteria would be crafted in such a way as to include bundled small-scale projects. Allowing multiple small-scale activities of the same kind—such as solar-home and efficient light bulb projects—to be packaged together as a single project would substantially increase their financial viability, without risking overcrediting.<sup>2</sup>

1. W.V. Reid and J. Goldemberg, eds., *Promoting Development While Limiting Greenhouse Gas Emissions: Trends and Baselines* (New York: UNDP and WRI, 1999).
2. As proposed by Mexico. See Chairmen's Text, paragraph 145. Sampling and conservative estimation techniques have already been successfully tested in pilot verification exercises of such projects. See *The Ilumex Verification and Certification Pilot Exercise: Objectives, Results and Lessons Learned*, World Bank—Norway Collaboration on AIJ, 1999.

CDM. (See Box 2.) As a practical matter, a hybrid such as the one illustrated in Figure 5 is more likely than any of the pure models described in the previous sections, especially the strict unilateral model.

### Open Architecture CDM

Taken alone, each of the above design models fits best the needs of a limited group of potential host governments and private sector entities that may wish to participate in the CDM. However, nothing in the Kyoto Protocol precludes any of the mod-

els or their co-existence. The lone exception is the multilateral CDM under a *single-supplier* arrangement. Because this approach would require all financial resources to be disbursed centrally, it precludes all other options. It is not recommended for the CDM.

Open architecture CDM envisions the different models described above operating in parallel—bilateral, multilateral-multiple funds, unilateral, and hybrid. Open architecture, however, would not *obligate* a country to

participate in the CDM in a particular fashion, but would allow Parties to choose one or more channels of participation, according to national circumstances and preferences. At this early stage in the development of the CDM, open architecture offers the best hope of learning-by-doing: the stakeholders gain practical experience using a menu of approaches that suit their circumstances. Considering the ongoing experiences of AIJ, the embryonic carbon funds, and the national CDM initiatives of some developing coun-





Environmental funds emerged in the last decade as potentially significant mechanisms for financing sustainable development, biodiversity conservation, and capacity building projects. Although environmental funds are tailored to the unique circumstances of individual countries and environmental goals, they typically have several common features:<sup>1</sup>

- *The ability to receive money from a variety of sources.* The most common sources of fund capitalization are bilateral and multilateral donors (e.g., the U.S. Agency for International Development and the Global Environment Facility), and resource use/pollution fees levied at the national level.
- *A board of directors.* A board—which makes decisions regarding project selection criteria, asset management, and other matters—typically includes a diverse group of stakeholders from government, civil society, and perhaps international donors. This diversity can provide continuity during changes of government, some degree of political insulation, and more efficient use of financial resources.

- *The ability to give grants (usually small) to a variety of actors.* Environmental funds can support project implementers from the private sector, NGOs, and government.
- *Financial structure.* Funds may be structured financially as endowments (e.g., the Mexican Nature Conservation Fund), sinking funds, which rechannel their entire principal and investment income over a fixed period of time, and revolving funds, which are replenished on a regular basis.

Experience to date has shown that such funds can be complex institutions performing a variety of functions, such as building public-private partnerships, working with local communities, and building national capacity.<sup>2</sup> Because some environmental funds have already identified a set of national sustainable development priorities and are established for building capacity and implementing projects, they are consistent with CDM needs and could support a portfolio of small-scale CDM projects. This could be done by establishing a CDM “window” in an existing fund or chartering a new fund. A key challenge

will be to attract significant new sources of public and private investment. Figure 5 shows how a domestic CDM fund could tap investment from other international funds and sources. The World Bank’s Prototype Carbon Fund, for example, will contribute to a Fund for Renewable Energy in Costa Rica that will, in turn, finance the baseline assessments and certification costs of multiple CDM projects.<sup>3</sup>

1. See K. Danish, “National Environmental Funds,” in *Greening International Institutions*, J. Werksman, ed. (London: Earthscan Publications Ltd., 1996), p. 163.
2. R. Bayon, C. Deere, R. Norris, and S. Smith. 1999. *Environmental Funds: Lessons Learned and Future Prospects*, IUCN. Online at <http://economics.iucn.org/pdf/issues-20-01.pdf> (May 1, 1999).
3. Prototype Carbon Fund, *Project Idea Note*, Costa Rica Fund for Renewable Energy of the Ecomarkets Project. Online at <http://www.prototypecarbonfund.org/> (April 10).

tries, Parties are already implicitly experimenting with an open architecture CDM. Since the CDM is a *new* tool for addressing climate change and promoting sustainable development, we cannot know ahead of time its most effective design.

The question does remain whether different models will compete effectively against one another or whether eventually one will crowd out all others. Although this is a possibility, it is too early to assess whether this will happen or if the consequences would

be desirable. Only experience can guide policy decisions on model competition. The core regulatory framework of the CDM should ensure that the Parties do periodically review experiences and refine the rules according to lessons learned.

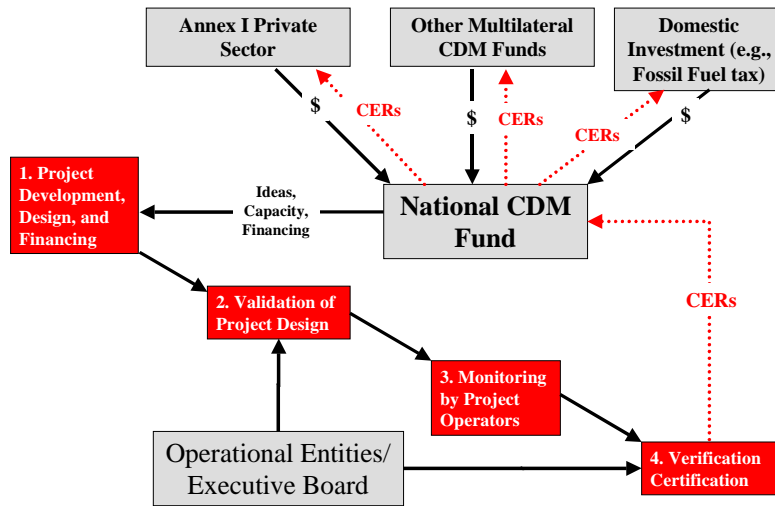
In comparison to a purely bilateral or unilateral CDM, which might in practice exclude some developing countries, open architecture could embrace a variety of potential participants. (See Table 2.) The importance of attracting CDM attention to

a variety of actors extends well beyond the immediate efforts to reduce emissions and develop the CDM market. To solve the problem of climate change over the longer term, investors of all types must begin to factor greenhouse gas considerations into decisionmaking processes. Currently, only a limited number of companies (and governments) are doing this. The CDM could help raise awareness that companies may benefit commercially from reducing emissions in the near term and will increasingly be held accountable for their own emis-



Figure 5

### A Hybrid CDM: National



Source: World Resources Institute

sions over the longer term. Indeed changing investor psychology—by aligning the climate, development, and commercial interests shown in Table 2—could be the mechanism’s most enduring contribution.

#### IV. A CLOSER LOOK: KEY ISSUES IN SHAPING A CREDIBLE OPEN ARCHITECTURE CDM

There are many methodological and institutional issues that must be decided before the Clean Development Mechanism can fully operate. This section addresses an important subset of those issues and the political decisions that are vital to shaping an environmentally sound, open architecture CDM that is conducive to the needs and interests of various stakeholders:

- **Competitiveness: CDM versus other Kyoto Mechanisms,**

- **Geographic distribution of projects,**
- **Role of government financing of CDM projects, and**
- **The mandate and role of the CDM Executive Board.**

The various models of the CDM discussed above will affect, and be affected by, these cross-cutting issues.

#### Competitiveness: CDM versus other Kyoto Mechanisms

The CDM will not operate in isolation. Instead it will compete with other opportunities to reduce emissions, including domestic actions within industrialized countries, and the other two cooperative mechanisms included in the Kyoto Protocol—joint implementation and international emissions trading. The relative attractiveness of these different options and whether CERs will

be more, less, or equally valuable than credits traded through the other Kyoto mechanisms has been the subject of much debate and concern.<sup>12</sup> How might CDM design issues affect the outcome?

According to several economic models, the CDM could account for a significant proportion—between 31 and 55 percent—of the total abatement effort required by the Kyoto Protocol.<sup>13</sup> A full assessment of the competition between different Kyoto Mechanisms is not possible here. Nevertheless, some observations about price and competition will help show how rules that support a plurality of CDM designs and a credible regulatory framework will enhance this mechanism’s competitive position in relation to other units traded through joint implementation (referred to as “emission reduction units,” or ERUs) or units exchanged through emissions trading (termed “assigned amount units,” or AAUs).

In the interest of equalizing the attractiveness of the CDM vis-à-vis joint implementation and emissions trading, some Parties have called for the adaptation and administration fees, as well as tighter regulations (as required under the CDM), to be extended to joint implementation and international emissions trading.<sup>14</sup> Although there may be compelling reasons for these requirements, such as the need to generate greater adaptation assistance resources, harmonizing fees and regulations will not equalize the attractiveness of the three mechanisms or the market prices of their respective units. Adaptation and administrative fees and the direct costs



Table 2

## Potential Roles of CDM Market Participants

Potential Investor / Market Participant	Potential Market Activity	Reason for Participation
Non-Annex I government	Invest in individual CDM projects or channel resources into domestic CDM funds	Promote national sustainable development objectives
Multinational corporation	Invest in bilateral projects or multilateral CDM funds	Offset company emissions; commercial interests
Niche company (e.g., solar or wind energy)	Develop individual CDM projects	Commercial interests; technology diffusion
Other private sector company (Annex I or non-Annex I)	Invest in projects or multilateral CDM funds	Offset company emissions; commercial interests
Institutional investors	Contribute to multilateral CDM funds	Portfolio diversification to lower risks; socially responsible investing
Annex I governments	Purchase credits on secondary markets, invest in CDM funds, etc.	Comply with Kyoto Protocol's Article 3 commitments
Regional/multilateral Development banks	Develop and manage portfolio of CDM projects	Promote sustainable development of member countries and build markets
Industry associations	Develop and manage project portfolio; invest members' capital in CDM fund or projects	Commercial interest of members or sector
Executive board or delegated body	Auction CERs centrally	Generate proceeds for adaptation and administrative costs; support unilateral CDM programs
Nongovernmental organizations	Design and develop CDM projects	Promote environment and development benefits
Brokers or other intermediaries	Match buyers and sellers; develop secondary markets; identify and develop projects; aggregate CDM projects into portfolios	Commercial interests



inherent in the CDM core regulatory framework will make the CERs more expensive to generate. However, unlike either emissions trading or joint implementation, the CDM is able to generate credits from 2000 to 2007, giving it an unparalleled head start.

*Risk* will also play an important part in determining the relative value of the different tradable emission credits. The Kyoto Protocol establishes that the respective emissions credits exchanged through the three Kyoto mechanisms—CDM, joint implementation, and emissions trading—are equivalent for the purposes of Annex I compliance.<sup>15</sup> None is given special preference. Provided that CERs, ERUs, and AAUs are denominated equally (e.g., one metric ton of CO<sub>2</sub> equivalent), then all units may be applied equally by Annex I Parties toward their emission obligations. Thus, if there were no risks that any units could be rejected or otherwise rendered invalid, their relative market values should be equal to one another.

However, the risks associated with the three forms of emission credits—CERs, AAUs, and ERUs—will not be identical. Holding a CER from a validated CDM project, which has been independently verified and certified, may be perceived as less risky (and therefore, have a greater market value) than purchasing a AAU from a country that is in danger of exceeding its Kyoto target or breaching other treaty obligations. The same will be true for ERUs transferred through joint implementation, where a “buyer-beware” liability rule already exists.<sup>16</sup> Overall, the prices of the various credits will reflect the rules of responsibility or liability

agreed to by the Parties. Once these rules have been established, the relative prices of CERs, ERUs, and AAUs will reflect the perceived risks associated with them, respectively. Because they will be independently verified and certified, CERs from any developing country will be less risky than ERUs and AAUs from some countries, especially some economies in transition, where institutional and regulatory capacities are questionable.<sup>17</sup>

The relative risk profiles of the different tradable credits underscores the importance of the CDM’s regulatory framework. While the unique CDM requirements—such as *project validation* and *independent verification*—may be costly and time consuming, they provide more certainty to the integrity and validity of the unit traded, relative to either emissions trading or joint implementation. This can actually serve as a competitive advantage, particularly in the early stages of the market.

Do the alternative CDM models affect the attractiveness of the CDM vis-à-vis the other mechanisms? As noted, a *single-supplier* multilateral fund would erect substantial barriers for many Annex I investors that wish to invest in the CDM, resulting in fewer projects. Restricting the CDM to any of the other individual models will also create a less attractive mechanism. The open architecture CDM is able to accommodate the most diverse group of investors from Annex I and non-Annex I coun-

tries alike: small companies, large multinational corporations, companies with and without project implementation experience, government agencies, institutional investors, and others. (See Table 2.) This appeal will increase the attractiveness of the

*Open architecture will enhance the CDM’s competitive position.*

CDM relative to other mitigation options under the Kyoto Protocol.

### **Geographic Distribution of Projects**

Several economic models suggest that up to 75 percent of CDM investment could be concentrated in China and India, where large volumes of low-cost abatement opportunities exist.<sup>18</sup> While such future estimates are necessarily shaky, the experiences under the AIJ pilot program suggest that concerns over concentration and lack of geographic diversity are not misplaced—of over 125 AIJ projects, only 5 have taken place in Africa.<sup>19</sup> The economic models that forecast most CDM investment in China and India do not factor in relative institutional capacities and investment risks. Model results are instead driven by these countries’ rapid growth rates and demand for new energy and infrastructure, because it is less expensive to build better new technology than to retrofit existing facilities. In reality, investors in these and other countries continue to face strong central bureaucracies, a lack of transparency, and other barriers to invest-



ment. Smaller, more transparent countries offering a better investment environment might compete quite effectively for CDM projects.

CDM design will undoubtedly influence the future geographic distribution of activities. Allowing only the bilateral model would likely favor the larger developing countries with low abatement costs. A strict unilateral approach would tilt CDM activities toward countries with existing strong governance and institutions. A multilateral CDM could engage a broader range of countries and even allow specialized geographic funds. Allowing these models to coexist under an open architecture would most likely foster a more balanced outcome than any individual approach operating alone.

However, expectations of an “equitable” CDM, under any architecture, should be tempered by other major factors that influence patterns of foreign direct investment, irrespective of the CDM. (See Box 3.) In many countries, contract enforcement is weak and transparent institutions are lacking. These features will inhibit all types of investment, including through the CDM.

Even careful crafting of CDM rules will not be able to change the underlying forces that shape investment decisions. However, some practical steps can be taken to promote geographic diversity within the CDM. For example, the Executive Board could facilitate the creation of one or more funds that seek to promote wide geographic distribution of project activities. This could take the form of a geographic distribution fund, as pro-

### Box 3

### Why Does Investment Go Where it Goes?

The factors driving private CDM investment patterns are likely to be complex and multifaceted. The institutional capacity of the host countries, as well as differences in greenhouse gas abatement costs among countries, will significantly shape the geographic mix of CDM activities. However, more conventional factors also influence foreign investment decisions, irrespective of the CDM, including the following:

- *Size* of the overall economy and population.
- *Income* levels and disparities between rich and poor.
- *Openness* to foreign investment, trade, and joint ventures, as well as exchange rate policy and ease of exporting.
- *Institutions*: the quality of legal institutions and practice (e.g., extent of corruption, vulnerability to organized crime, enforcement of contracts).

- *Government* role in the economy, such as burden of government expenditures, rates of public saving, tax rates, and the overall competence of civil service.
- *Finance*: Perceived stability and solvency of financial institutions, and credit ratings given by outside observers.
- *Infrastructure*: Quality of roads, communications, and technology, among others.
- *Labor* costs, efficiency, and competitiveness, including basic education and skills.

**Sources:** Adapted from *The Global Competitiveness Report 1999* (Geneva, Switzerland: World Economic Forum, 1999): 96; and UNCTAD, *World Investment Report 1999: Foreign Direct Investment and the Challenge of Development* (New York: United Nations, 1999), Overview.

posed by the African countries.<sup>20</sup> Such a fund might identify and bundle together projects that are high quality, but located in the commercially high risk, least developed countries. This kind of arrangement could begin to increase the viability of investing in commercially unattractive countries. Whether a targeted geographic fund, or perhaps a fund targeted to the diffusion of a particular technology such as solar energy, could sufficiently align the relative risks and rewards of investing in least developed countries is unclear. Industrialized country governments may need to provide a partial subsidy. This controversial subject is discussed in the next section.

### Role of Government Financing

Industrialized country governments are likely to play a variety of roles in supporting CDM implementation.<sup>21</sup> According to the Kyoto Protocol, public entities may participate in CDM projects, including “in the acquisition of certified emission reductions.”<sup>22</sup> However, the exact character of that participation is “subject to whatever guidance may be provided by the executive board of the clean development mechanism.” Table 3 shows a range of activities that Annex I governments could support, including capacity building and project financing.



Table 3

## Range of CDM Activities that Could be Supported by Public Financing

Government Financing Activity	Use ODA?	Earn
Capacity and CDM institution building in non-Annex I countries	Yes	No
Feasibility studies for potential CDM projects	Yes	No
Additional contributions to adaptation assistance	Yes	No
Multilateral contributions to a geographic distribution fund	Undecided	Undecided
Use of officially supported export credits	No	Undecided
Bilateral financing of CDM activities	Undecided	Undecided
Purchase of certified emission reductions	Probably No	Yes

Two critical questions are undecided by the Parties: can Annex I governments earn CERs by *directly financing CDM projects*? If so, can this financing come from Official Development Assistance (ODA) accounts?

In making these decisions, it is vital that negotiators and stakeholders consider the existing international guidelines that govern the use of official aid. (See Box 4.) According to the Development Assistance Committee of the OECD, the purpose of such rules is to target much needed external resources to *projects and countries with limited or no access to market financing*, while limiting trade and aid distortions.<sup>23</sup> In other words, public aid should not be provided in cases where private financing is obtainable. These aid guidelines serve both to direct scarce aid resources to countries where it is most needed, and prevent market distortions that arise from OECD governments subsidizing private sector investments overseas. These market distortions harm not only the OECD country tax payers, they increase project costs in the recipient country.

OECD guidelines suggest that development assistance resources should be limited to certain uses under the CDM. The most uncontroversial use of development aid is likely to be for adaptation studies and projects. Aid to developing countries for building capable national CDM institutions might be particularly well targeted. Development assistance might also be directed toward feasibility studies for potential CDM projects, perhaps in high risk countries seeking unilateral CDM implementation.

The most intense controversy arises among Parties when they consider using development assistance moneys to directly finance CDM projects or purchase CERs on an open market. Historically, developing countries have responded by insisting that existing aid for worthy development objectives not be diverted to finance climate protection. They expressed concern in 1998, asking how it will “be ensured that financing for CDM projects shall be *additional* to ODA and other international funding” obligations. In response, both the Eu-

ropean Community and the United States asserted that these issues would not arise because the CDM will primarily be a vehicle for private sector investment.<sup>24</sup> Nevertheless, some countries do intend to use development assistance to finance CDM projects or purchase CERs on an open market, so the question of ODA additionality remains.<sup>25</sup>

Unfortunately, an ODA additionality requirement, as it is currently understood, will not help resolve this concern of many developing countries, because there is no agreed-upon ODA *baseline* from which to assess additionality. Without such a baseline, an ODA additionality test is unlikely to influence public sector behavior. The only obvious and objective benchmark from which to judge such an additionality would be the goal of 0.7 percent of GDP pledged by industrialized countries at the 1992 Earth Summit in Rio de Janeiro. This is likely to prove unpopular.

If aid resources are to be used either alone or in high percentage with private investment to finance CDM



Although not widely discussed in the climate negotiations, existing guidelines already govern the definitions and use of public financial flows. The category of public spending most relevant to the CDM discussion is ODA. According to the OECD, grants and loans to developing countries are considered ODA if they:

- are undertaken by the government,
- promote economic development and welfare as the main objective, and
- are on concessional terms, having a grant component of at least 25 percent.

Only those flows meeting these criteria are considered ODA. For example, financing from export credit agencies, which is provided at near commercial terms, does not qualify as ODA. Will public financing for credit-earning CDM

projects be considered ODA? Because official aid must be *development* and *welfare* motivated, making financing contingent upon receiving credits with potentially significant value would be highly suspect on these grounds. In the case of the World Bank’s Prototype Carbon Fund, the private sector has also contributed to the fund, giving the appearance that welfare may not be the main objective of such investments.

Tied aid is also subject to OECD guidelines.<sup>1</sup> These flows include loans, grants or other associated financing packages that are conditional upon the procurement of goods and services from the donor country. OECD rules restrict the use of tied aid to projects that (1) have at least a 35 percent grant element (50 percent for least developed countries), (2) are financially *non-viable* (except for least developed countries), and (3) are in developing countries with a per capita GDP below \$3,030.

The financial viability of projects is determined on a case-by-case basis. According to the OECD’s *ex ante* guidelines on tied aid, renewable energy, coal gasification, telecommunications, and transportation projects tend to qualify as financially nonviable. In addition to traditional uses of tied aid, the CDM could introduce a new variation on assistance tied to the acquisition of credits, which would confer a clear benefit on the donor. This suggests that the CDM may need to subject government financing to similar or narrower conditions.

1. OECD, *Arrangement on Guidelines for Officially Supported Export Credits* (Paris: OECD, 1998). Chapter III: Provisions for Trade-Related Aid. Online at <http://www.oecd.org/ech/act/xcred/arrangement/anglais/arrangement-index-en.htm>. OECD, *Ex Ante Guidance For Tied Aid*, 1996.

projects, it might be more palatable for Parties to drop the unenforceable ODA additionality test and ensure through other approaches that aid is channeled exclusively toward geographic equity and other goals not served by the market. For example, Annex I governments could be encouraged to contribute to the national CDM funds of least developed countries or other multilateral funds that have explicit geographic goals.

### The Mandate and Role of the Executive Board

An Executive Board will supervise the CDM. In practice, this means overseeing the core regulatory framework of the CDM—such as project validation and certification of emission reductions—and ensuring that

information about CDM activities is publicly accessible.<sup>26</sup> The Protocol Parties should consider a broader mandate for the Executive Board. Open architecture CDM, along the lines sketched above, suggests an important and multifaceted role for assisting project implementation and financing. In fact, the Kyoto Protocol specifically calls on the CDM to “assist in arranging funding for certified project activities as necessary.”<sup>27</sup> To translate this language into practical terms, several ideas have been put forth which, to varying degrees, are conducive to the different CDM design models presented above. Taken together, these could represent a suite of measures to promote sound projects under the various CDM design models.

The CDM Executive Board could provide a *clearinghouse and information center* for project opportunities. This is particularly compatible with a bilateral CDM, because it attempts to draw together interested project developers, project operators, and financial resources. Acting as a clearinghouse would help lower the search costs for matching potential investors with project opportunities in developing countries.<sup>28</sup>

The mandate of the Executive Board could be shaped to promote broad developing country participation in the CDM. As noted above, this could take the form of one or more *geographic distribution funds*, for which the Board would seek financial support from interested governments and, per-



*Open architecture CDM will promote innovation and learning-by-doing.*

haps, corporations as well. Under such an arrangement, the Executive Board (or its designated agent) could develop project and other operating criteria for the fund (e.g., equity and sectoral). It could also *develop guidelines and provide assistance for other CDM funds*. A template for the administrative structure could help facilitate the emergence of other mutual fund-style instruments. Assistance in establishing funds could also be extended to the domestic level (such as through national environmental funds), thereby, supporting unilateral initiatives.

Vesting power in the Executive Board to *auction CERs* would support all CDM models, but especially non-Annex I countries that develop projects unilaterally. Auctions indirectly assist financing activities more broadly by providing essential information to investors about the market price of CERs, thereby, reducing price uncertainties. Periodic centralized auctioning would serve broader purposes and interests as well. Most notably, the CDM should auction a portion of CERs from all projects to generate the administrative and adaptation proceeds called for in the Kyoto Protocol.<sup>29</sup>

Finally, the Kyoto Protocol already gives authority to the Executive Board to provide guidance on participation

of public and private entities in the CDM.<sup>30</sup> As the preceding discussion suggests, this will be challenging, particularly if some Parties wish to ensure that aid resources are targeted toward the regions and projects that are beyond the reach of the market, while others do not. One concrete step the Board could take would be to draft *ex ante* guidelines for public sector financing in the CDM. This could be analogous in purpose, if not scope, to the *ex ante* guidelines the OECD developed for tied aid.<sup>31</sup>

Since the Board is expected to be small and perhaps meet only several times per year, it will be essential that it delegate some responsibilities to other suitable agents or form smaller panels to act on its behalf.<sup>32</sup> This will be necessary to avoid operational bottlenecks and excessive bureaucracy.

## **V. CONCLUSION AND RECOMMENDATIONS**

Parties and observers commonly advance three Clean Development Mechanism design models. *Bilateral* CDM is characterized by a close relationship between Annex I investor and host country in the design and financing of a project. A *multilateral* approach separates project finance from Annex I investment sources by channeling investments through a centralized mechanism. Multilateral CDM typically pools many project activities together, presumably low-

ering transaction costs and the risk of individual project failures. The *unilateral* model relies on the host country to develop and finance projects on its own. Certified emission reductions from unilaterally implemented projects could subsequently be sold to Annex I investors.

Although these models are often presented as conflicting with each other, there is no inherent reason why they cannot coexist and operate in parallel, through an open architecture. Open architecture CDM would also encourage hybrid approaches that combine elements of different designs. Such innovation and learning-by-doing will be critical, at least in the early stages of the CDM. Thus, foreclosing options for implementing CDM projects could stifle this process, making the CDM less competitive relative to other abatement options, as well as delivering benefits to a narrower group of countries and sectors.

While open architecture CDM will best deliver on the high expectations placed on this mechanism, its creation will not be spontaneous. Parties should consider the following findings when attempting to shape an environmentally sound CDM that promotes broad geographic participation.

***Multiple implementation and financing approaches are possible and desirable.*** Embracing open architecture CDM will help countries learn-by-doing and gain practical experience. Restricting the allowable design approaches of the CDM would restrict benefits to certain sectors or countries.





**Parties should periodically review and evaluate CDM implementation.** The Parties should review the CDM's institutional design, including its core regulatory framework and open architecture, and make future adjustments based on actual experience.

**Open architecture will enhance the competitive position of the CDM in relation to other abatement options.** Many elements influence the competitiveness between the Kyoto Mechanisms, including abatement costs, fees, regulatory requirements, rules of liability, and CDM architecture. Altering any single factor cannot equalize the attractiveness of the different mechanisms. All factors considered, a strong and transparent regulatory system coupled with an open architecture will enhance the CDM's competitive position.

**Public sector financing may require guidance.** An ODA additionality criterion is not likely to influence public sector investment in the CDM, nor should such a requirement be expected to arrest declining aid flows. Parties should seek to ensure that scarce aid resources are used most effectively under the CDM, consistent with existing OECD guidelines. Public financing for the CDM could be dedicated primarily to market infrastructure, capacity building, and feasibility studies. If aid is used for credit-generating activities, it should be channeled toward commercially unattractive countries and projects that meet sustainable development priorities.

**The CDM Executive Board could be an important institution for promoting wide participation.**

There are many steps the Executive Board, or its designated agents, can take to promote wide participation and CDM market development. Credit auctions, fund guidelines, geographic funds, information dissemination, and clearinghouse functions will assist project development and help the CDM market develop in an inclusive, rather than exclusive, manner.

**Open architecture CDM will not place the mechanism in environmental peril.**

The CDM's environmental controls are not stronger within one or another CDM design model. All projects, regardless of which design model is used, are subject to common standards and regulatory requirements.

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## NOTES

1. The Clean Development Mechanism is outlined in Article 12 of the Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC).
2. P. H. Sand, "Trusts for the Earth," in *Transnational Environmental Law: Lessons in Global Change*. (London: Kluwer Law International Ltd., 1999), p. 291.
3. For a more complete explanation of the project cycle and CDM regulatory framework, see UNFCCC, presentation of document FCCC/SB/2000/3 by Chairman of the Contact Group on Mechanisms, June 5, 2000 (all UNFCCC documents available online at <http://www.unfccc.de>); and Kevin Baumert and Nancy Kete, *Designing the Clean Development Mechanism: Operational And Institutional Issues*. Report prepared for the OECD and IEA Forum on Climate Change, May 15, 2000. Online at [http://www.wri.org/climate/pdf/oecd\\_cdm.pdf](http://www.wri.org/climate/pdf/oecd_cdm.pdf).
4. For other descriptions of these models, see Farhana Yamin, "Operational and Institutional Challenges," in *Issues and Opinions: The Clean Development Mechanism*. J. Goldemberg, ed. (New York: United Nations Development Programme, 1998). and Richard Stewart et al., *The Clean Development Mechanism: Building International Public-Private Partnerships*, UNCTAD document number UNCTAD/GDS/GFSB/Misc.7 (New York: United Nations, 1999).
5. UNCTAD, *World Investment Report 1999: Foreign Direct Investment and the Challenge of Development* (New York: United Nations, 1999), Annex Table A.I.1.
6. This model is supported by some African countries. UNFCCC, *Mechanisms Pursuant to Articles 6,12, and 17 of the Kyoto Protocol*, text for further negotiation on principles, modalities, rules and guidelines, note by the Chairmen, document FCCC/SB/2000/3, April 12, 2000 (Hereafter, "Chairmen's Text"), paragraphs 167 and 168. See also Youba Sokona, Stephen Humphreys, and Jean-Philippe Thomas, "The Clean Development Mechanism: What Prospects for Africa?" in *Issues and Opinions: The Clean Development Mechanism*. J. Goldemberg, ed. (New York: United Nations Development Programme, 1998).
7. Article 12.5(a) requires voluntary approval of project activities from "each Party involved," thus allowing, in principle, a single developing country Party to implement a project without any Annex I participation. See also UNFCCC submission of Mexico on the CDM, document FCCC/SB/1999/MISC.3/Add.4.
8. See Costa Rica's Certifiable Tradable Offset (CTO) system and the UNFCCC submission by Mexico on the CDM, document FCCC/SB/1999/MISC.3/Add.4.
9. *National Strategy Study for Implementation of the CDM in Colombia* (Santafé de Bogotá: Ministerio del Medio Ambiente and the World Bank, 2000), Executive Summary. For more information about country risk, see *International Country Risk Guide*, published monthly by The PRS Group, online at <http://www.prsgroup.com/>.
10. For example, see the World Bank National Strategy Studies Program. Online at <http://www-esd.worldbank.org/cc/>
11. See Costa Rica's CTO system, and the UNFCCC submission by Mexico on the CDM, FCCC/SB/1999/MISC.3/Add.4.
12. For debate, see Chairmen's Text and other submissions by Parties.
13. ZhongXiang Zhang, *Estimating the Size of the Potential Market for All Three Flexibility Mechanisms under the Kyoto Protocol*, final report prepared for the Asian Development Bank, 1999.
14. See Chairmen's Text and other submissions by Parties.
15. Article 3, paragraphs 10-12 of the Kyoto Protocol to the UNFCCC.
16. Article 6.4. If the compliance of a Party transferring an ERU is found to be questionable, the Party acquiring that ERU *cannot* use it to fulfill its own obligations until the question of compliance is resolved. Several analogous rules of liability have been proposed for the CDM (see Chairmen's Text, paragraphs 197 to 200). Even with such a rule, the likelihood of host country compliance violations are substantially reduced in the CDM, since non-Annex I Parties are not subject to Article 3/Annex B requirements.
17. This, however, will depend upon the rules of liability for international emissions trading. For options, see Chairmen's Text, Part IV. For a discussion of climate change and countries with economies in transition, see Kevin Baumert, Elena Petkova and Diana Barbu, *Capacity for Climate: Economies in Transition After Kyoto* (Szentendre, Hungary: The Regional Environmental Center and the World Resources Institute, 1999).



18. ZhongXiang Zhang, 1999. Emphasis added. Online at <http://www.oecd.org/ech/pub/exantee.pdf>.
19. UNFCCC. *Activities Implemented Jointly Under the Pilot Phase*, issues to be addressed in the review of the pilot phase, including the third synthesis report on activities implemented jointly, note by the secretariat, document FCCC/SB/1999/5/Add.1, October, 14 1999.
20. Chairmen's Text, paragraph 169, equitable distribution fund.
21. These issues will be further elaborated on in a forthcoming WRI Climate Note, *Aid, Trade, Investment, and the Clean Development Mechanism: Financing a Sustainable Energy Future*.
22. Article 12.9 of the Kyoto Protocol to the UNFCCC.
23. OECD, *Ex Ante Guidance For Tied Aid*, document number OCDE/GD(96)180 (Paris: OECD, 1996).
24. UNFCCC, document FCCC/SB/1998/MISC.1/Add.6 (for the EU and Switzerland), and *Responses to G-77/China Questions on Flexibility Mechanisms*, Washington, DC: U.S. Department of State, September 10, 1998, online at [http://www.state.gov/www/global/global\\_issues/climate/doc-g77\\_china\\_980910.html](http://www.state.gov/www/global/global_issues/climate/doc-g77_china_980910.html) (April 19, 2000). Emphasis added on the word "additional."
25. Kenichiro Yamaguchi, "Combating Global Warming – the Japanese Perspective," *Perspectives on Policy, Resources for the Future*, online at <http://www.weathervane.rff.org/pop/pop8/japan.html> (May 25, 2000).
26. See Baumert and Kete, 2000.
27. Article 12.6 of the Kyoto Protocol to the UNFCCC.
28. To a limited extent, this is being undertaken by the FCCC Secretariat in the AIJ phase. See UNFCCC. "Offers of Activities by Parties," online at <http://www.unfccc.de/program/aij/aijoff.html> (April 19, 2000).
29. Article 12.8 of the Kyoto Protocol to the UNFCCC.
30. Article 12.9 of the Kyoto Protocol to the UNFCCC.
31. OECD, 1996 and OECD, 1998.
32. At the time of writing, the draft text of the mechanisms decision includes such language, allowing the Executive Board to "assign, as necessary, functions to other institutions under Article 12 within the framework provided for by the COP/MOP." Chairmen's Text, paragraph 219(p)(m), supported by the European Union and other Parties.



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