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**DESIGNING THE CLEAN DEVELOPMENT MECHANISM: OPERATIONAL AND
INSTITUTIONAL ISSUES**

2000 Forum on Climate Change (supported by the OECD and the IEA)

Please note: This document includes Figure 5 that was missing from the previous version submitted to OLIS on 10 May 2000.

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ABSTRACT

The international climate change negotiations over how the Clean Development Mechanism (CDM) should operate, could become stuck over the question of how the CDM will be structured. A review of Parties' submissions reveals three clear alternatives for the CDM's core structure— typically described as bilateral, multilateral, or unilateral. Each model is distinct in important ways and each will best fit the needs of some, but not all, of the Parties and other stakeholders. Thus it is not surprising that some Parties advocate the use of only one approach, which best serves its particular national circumstances. This paper examines the characteristics of different design options, and describes how a more flexible approach, termed an “open architecture” CDM, might operate. Such an approach would allow elements of different designs to complement one another and allow the CDM to deliver a broader set of climate and sustainable development benefits. The authors suggest that this more flexible approach can reconcile apparently conflicting visions of the basic CDM structure, and consequently, facilitate consensus.

Regardless of whether a CDM project is implemented through a bilateral, multilateral or unilateral approach, any project must be subject to a common regulatory framework. Project validation, registration, verification and certification make up this basic regulatory process. A critical and overarching component of this framework is an accreditation process for entities that will validate projects and verify emission reductions. The key institutions involved in this regulatory framework are the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (COP/MOP), the Executive Board of the CDM, accredited operational entities, national CDM offices, and project operators. Determining the respective roles of these institutions, which should be crafted to minimise bias and conflicts of interest, will be a major challenge to developing a CDM regulatory framework that simultaneously promotes *environment integrity, transparency* and *investor confidence*. Decisions must balance the need for regulatory oversight by independent and international bodies, with the need to minimise bureaucracy and transaction costs by streamlining procedures.

I. INTRODUCTION

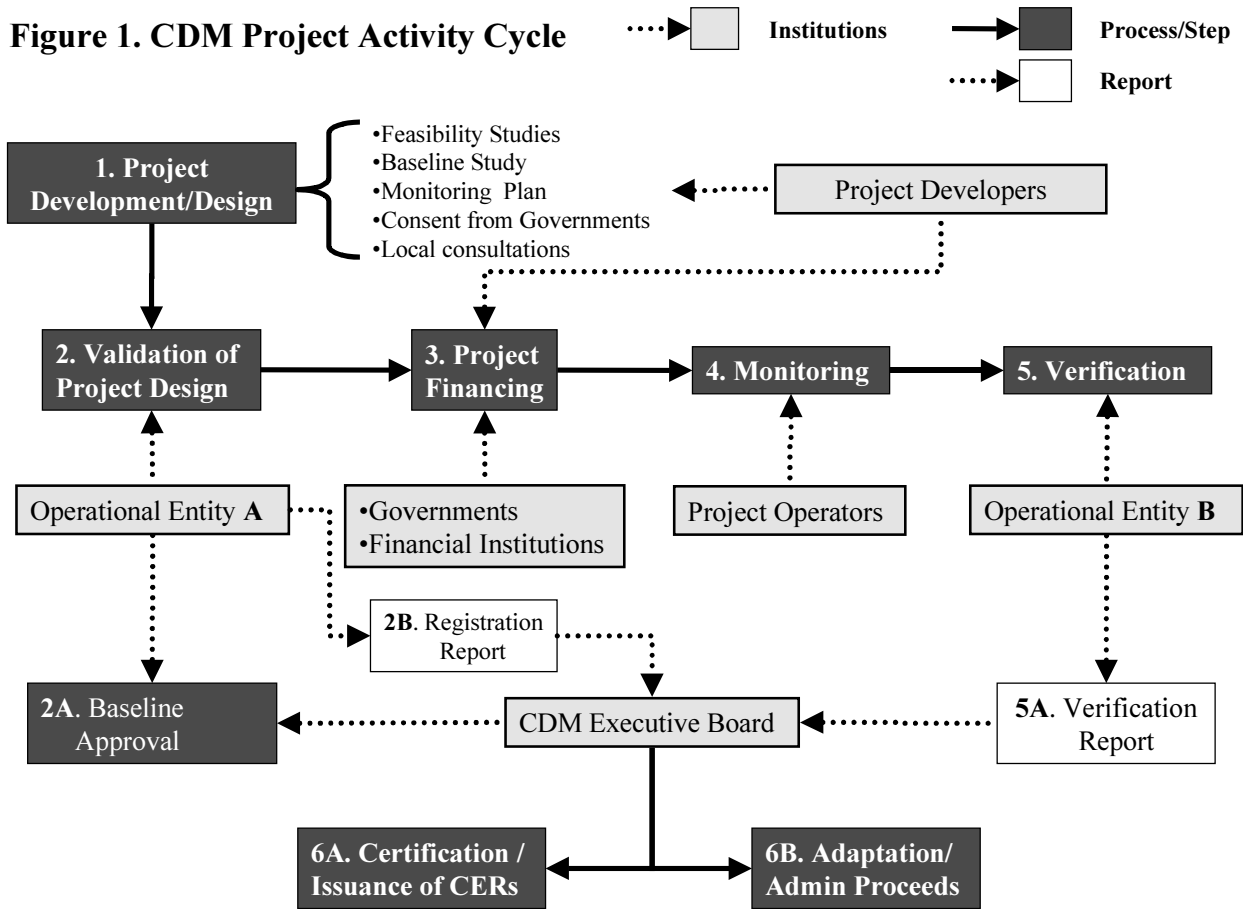
The Clean Development Mechanism, established by the Kyoto Protocol to the Climate Convention, promotes investment in projects that both reduce greenhouse gases emissions and foster sustainable development in developing (non Annex I) countries. If designed properly, the CDM could become an important element of the broader effort to prevent dangerous human-induced climate change.

Different CDM design choices have, however, been the subject of substantial disagreement among Parties and interested observers. This is not surprising. Various design options will largely shape the type of projects that take place, geographic distribution of those projects, the overall size of the CDM, the overall attractiveness of the CDM relative to other mitigation options, as well as the credibility of the certified emission reductions (CERs, or “credits”) generated by projects. And while laying out the basic premises of the mechanism, in most cases the Kyoto Protocol does not favour one CDM design choice over another.

This paper addresses the two key institutional dimensions of the CDM: (1) design of the regulatory framework and (2) design of the implementation models. Common regulatory standards are necessary for a credible CDM market to develop. While consistent application of standards and processes to *all* projects is the key to creating high quality certified emission reductions, implementation approaches can vary significantly. Thus, with respect to the second dimension, allowing CDM projects to be implemented flexibly through a variety of approaches—commonly referred to as bilateral, multilateral and unilateral—could allow possible CDM benefits to be distributed to a wider group of stakeholders while not weakening the environmental integrity of the mechanism. Combining different implementation approaches, and allowing them to operate in parallel through an “open architecture” approach, might better deliver the set of objectives deemed important to many Parties, including broad participation by host governments and investors, viability of small-scale projects, capacity building, and a competitive CDM.

Central to understanding both the CDM regulatory framework and the various implementation models is a basic CDM project activity cycle, sketched in **Figure 1**. These six steps are likely to involve a wide range of different actors, including those from industrialised and developing countries, the public and private sector, and international institutions. Steps 2, 5 and 6 of the project activity cycle—project validation, certification and verification—together form the core of the regulatory requirements envisioned in Article 12 of the Kyoto Protocol. This framework is elaborated in **Section II**. Steps 1 and 3—project development and financing—together form the key variables in the different implementation models of the CDM. **Section III** details three core implementation models of the CDM, as well as an open architecture view that envisions different models operating in parallel. **Section IV** highlights four key issues to shaping an environmentally sound open architecture CDM. In particular, by elaborating the rules for CDM funding arrangements, public sector participation, and the role of the Executive Board, there are a number of steps the Parties can take to promote a flexible CDM that best delivers on the extremely high expectations placed on this mechanism. A final section summarises the paper’s conclusions.

Figure 1. CDM Project Activity Cycle



II. THE CDM REGULATORY FRAMEWORK

This section outlines the different stages of the CDM regulatory framework. The outcome of this process is the issuance of CERs that may be used by industrialised (Annex I) countries to contribute toward part of their obligations under the Kyoto Protocol. Many elements of these stages can be found in the *Note by the Chairmen of the Contact Group on Mechanisms*,¹ although in many cases there is substantial disagreement among Parties on institutional and procedural issues. The stages of the regulatory framework include: accreditation, validation, monitoring, verification, and certification. With the exception of *accreditation*, these steps, and the associated key institutions, can be seen on **Figure 1**.

The CDM regulatory framework outlined below is designed to fulfil three broad, and mutually reinforcing, objectives:

1. Ensure environmental integrity
2. Promote transparency
3. Promote investor confidence

First, the key elements for ensuring *environmental integrity* include the presence of independent third parties, and appropriate checks and balances between participating institutions. Such procedural and institutional arrangements are necessary, but not sufficient, conditions to ensuring environmental quality. Equally important is developing common and workable methodologies for developing monitoring plans and project baselines, subjects beyond the scope of this paper. Second, *transparency* can be promoted by ensuring that public information is made available during the appropriate stages of the project activity cycle. A transparent process will also better engage stakeholders from civil society in the CDM. Finally, without a system that promotes *investor confidence*, the CDM is unlikely to develop. Confidence can be earned by standardising the processes and procedures necessary to generate CERs and guarding against conflicts of interest within these processes. Arbitrary or flexible rules that vary from project to project will create substantial *uncertainty* regarding whether projects will be objectively approved and the emission reductions independently certified. These uncertainties increase associated *risks*, which decrease the attractiveness of the CDM.

The key institutions involved in the CDM regulatory framework are the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (COP/MOP), the Executive Board of the CDM, accredited operational entities, national CDM offices, and project operators. **Tables 1-5** summarise the functions of the relevant institutions within each step of the regulatory framework outlined below.

¹ “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.” FCCC/SB/2000/3. 12 April 2000 (Hereafter: “Chairmen’s Text”).

Operational Entities and the Accreditation Process

The participation of independent third parties will be critical in several stages of the CDM regulatory framework, namely for validation and verification (shown in steps 2 and 5 of the project activity cycle). An accreditation process must be established to ensure that the institutions undertaking these functions are appropriately qualified. Accreditation processes are already common in existing environmental management systems (and other professional fields such as accounting and banking), and will help ensure that the regulatory process is based on standards and accountability.²

The Chairman of the Contact Group on Mechanisms has elaborated organisational requirements for operational entities,³ which could form the basis of accreditation criteria. These criteria should ensure that, *inter alia*, operational entities are accredited based on:⁴

Table 1. Key Institutions: Accreditation

Institution	Function
COP/MOP	• Develop/approve accreditation standards
Executive Board	• Develop/approve accreditation standards • Accredit operational entities or appoint an accreditation body • Perform checks on operational entities

- *Demonstrated competence* and capacity to validate projects and/or verify emission reductions of particular project types;
- *Independence* from the financing, implementation and development of CDM project activities;
- *Financial responsibility* for consequences of errors and omissions (e.g. insurance).

So long as these standards are met, accredited operational entities could include a wide variety of institutions, including accounting firms, non-governmental organisations, government bodies, or international organisations, from developing, transitional or industrialised countries alike. Private companies such as Société Générale de Surveillance, Det Norske Veritas, ICF Kaiser, and PriceWaterhouseCoopers have already been involved in pilot verification and certification exercises and may already be accredited to operate in other fields of environmental assessment.⁵

The entity most appropriate to overseeing the accreditation process is the Executive Board of the CDM. The Board could also appoint one or more accreditation bodies to assist in this process.⁶ A desirable accreditation process will also include surprise spot checks and periodic re-accreditation for operational entities conducting validation and verification exercises.

² See Jed Jones, "Certification and Verification of Emissions Trading Activities." Lloyd's Register Industry Division. 1998; and Environomics Incorporated. *Options for Process and Institutional Arrangements for Conformity Assessment for the Clean Development Mechanism*. November 1999.

³ Chairmen's Text. See Appendix E. Paragraph 329.

⁴ See Chairmen's Text and Erik Haites and Farhana Yamin. "The Clean Development Mechanism: Proposals for its Operation and Governance." 1999.

⁵ See, for example, "The Ilumex Verification and Certification Pilot Exercise: Objectives, Results and Lessons Learned." World Bank – Norway Collaboration on AIJ. 30 July 1999. See also, Environomics, 1999.

⁶ See Environomics, 1999 for a more detailed discussion of whether one or more accreditation bodies should exist.

Project Validation and Registration

Article 12 of the Kyoto Protocol refers to “certified project activities,” implying that the project itself requires initial approval in order to be eligible to earn credits under the CDM. This process—termed validation is shown as step 2 in **Figure 1**.

Project validation is an initial assessment of the project’s design, undertaken before implementation, that determines whether the project meets the agreed criteria of the CDM. Validation services should be conducted by an accredited operational entity, based on information provided to the validator by the project developers and other project stakeholders.⁷ Key elements of a project validation exercise include:

- Assessment of the baseline study.
- Assessment of the monitoring plan.
- Assure that all involved Parties have voluntarily approved the project.
- Assure that the project contributes to sustainable development, according to the host country requirements, and that project developers have consulted with, and adequately addressed, concerns of potentially affected local populations.
- Notify project participants of validation status.

Addressing these last two points will be greatly facilitated by capable host country CDM programs. Costa Rica, Guatemala, and other AIJ programs with clear project guidelines are able to assist investors in developing projects and gaining prompt government approval. The ease of project validation will also depend on whether clear standards and acceptable methodologies are developed at the international level by the COP/MOP and/or the Executive Board. For example, some Parties support the development of a baselines reference manual or other handbook.⁸ Such an “on-line” or otherwise widely disseminated tool would indeed be helpful for both project developers and the operational entities conducting validation. Some projects that are not conducive to

standardised methodologies, or that lack precedent, are likely to require consultations with the Executive Board. For example, as shown in **Figure 1** step 2A, the operational entity could be required to seek baseline approval for some project types from the Executive Board as part of the validation process.⁹

Table 2. Key Institutions: Validation and Registration

Institution	Function
COP/MOP	<ul style="list-style-type: none"> • Develop and approve validation standards
National CDM Office	<ul style="list-style-type: none"> • Ensure project meets sustainable development requirements • Manage government approval process • Assist project developers as necessary (e.g. in providing data for baselines)
Operational entities	<ul style="list-style-type: none"> • Assure that project meets validation criteria • Make pre-validation report public • Report to the Executive Board
Executive Board	<ul style="list-style-type: none"> • As necessary, assist in the approval of baselines and monitoring plans • Register projects (or OE) • Make validation decision and supporting information available to the public

⁷ The seeds of this requirement are included in the Chairmen’s Text. Part II A. Paragraph 160, supported by Switzerland: “Substantial objections by stakeholders shall be taken into account.”

⁸ See Chairmen’s Text, paragraphs 152 – 155.

⁹ See proposal by the Chairmen, paragraph 164 of the Chairmen’s Text.

Addressing concerns of local communities is another potentially challenging component of validation. Although providing climate benefits, some projects may potentially displace populations or have some adverse local impact. In such cases, the validating entity should make a pre-registration report public for a fixed period of time, providing ample opportunity for public comment and consideration. This is a common procedure for infrastructure and other projects, many of which require environmental impact assessments.¹⁰ These measures will help ensure the early participation of potentially effected communities during the *design* phase of the project and reduce the chances of conflicts during project implementation. Another option, which could achieve the same outcome, is for the host government to require these steps *before* the project receives its consent.

Parties are also currently considering whether the validating entity should be selected by the Executive Board of the CDM *or* by the project developers.¹¹ Provided that there is a sound accreditation process in place for operational entities, allowing the project implementers to select a validator should not lessen the system integrity, thereby avoiding unnecessary administrative bottlenecks.

Once the validation process is complete, some Parties propose that the project be registered Executive Board of the CDM.¹² An analogous procedure already exists for the AIJ pilot phase: the COP considers only AIJ projects for which reports from the “designated national authorities” of Parties participating in the activity have been received by the FCCC secretariat.¹³ Registration would allow the Executive Board to maintain a list and track CDM projects. This step could be very simple, and involve little more than submitting standardised forms.¹⁴ Upon receipt of such forms or a registration report from the operational entity conducting the validation services, the Executive Board would:

- Ensure that the validating entity is properly accredited to perform the particular validation services required of the project.
- Check the validation report to ensure its completeness.
- Make information public regarding the validated project, taking into account the confidentiality concerns of project developers.

Table 3. Key Institutions: Monitoring

Institution	Function
COP/MOP and/or Executive Board	Develop and approve basic monitoring standards
Project operators and/or independent third parties	Monitor necessary data and gather required information, according to the monitoring plan

Overall, project validation and registration provide added insurance to investors that the project is expected to generate CERs. Thus, a registered status should lower project risk and thereby assist in the financing of a CDM project, shown as step 3 of the project activity cycle. The project now has an official license to create credits, and assuming that the project is financed and capably implemented, CERs should be generated. To provide added clarity and certainty to this process, Parties will need to decide whether validation or the subsequent registration with the Executive Board constitutes the *formal acceptance* of the project into the CDM.

¹⁰ Elena Petkova with Peter Veit. “Environmental Accountability Beyond the Nation-State: The Implications of the Aarhus Convention.” *Environmental Governance Notes*. World Resources Institute, April 2000.

¹¹ Chairmen’s Text, paragraph 130.

¹² Chairmen’s Text, paragraph 219.

¹³ Uniform Reporting Format. Available: http://www.unfccc.de/program/aij/aij_urf.html.

¹⁴ Environomics, 1999, Section III, Page 4.

Monitoring Procedures

Project monitoring—step 4 of the project activity cycle—should be conducted by the project operators, in a transparent and verifiable fashion, in accordance with the monitoring plan approved during project validation. Data to be monitored includes emissions and/or absorptions of greenhouse gases resulting from project activities. More general data or information relating to project performance may also require monitoring. Finally, the design of the project's baseline will determine the project boundaries to be monitored, which may require accounting for indirect emission sources such as those related to electricity inputs for projects with an energy efficiency component. Data from monitoring should be collected and reported according to a standardised format and procedures approved by the Parties. Project operators could use third parties to assist in implementing a monitoring plan, provided they are independent of the interests of the operational entities conducting the validation or verification processes.

Verification of Emission Reductions

The Kyoto Protocol stipulates that the Parties shall elaborate procedures for independent auditing and verification (Article 12.7). Thus, once a project has been financed and is operating for a period of time, a verification process—shown in step 5 of the project activity cycle—should assess the quantity of emissions actually reduced by the project activity (i.e. *ex post*). Key elements of this process include:

- Periodic review and full audit of monitoring data, project documentation, and project operations. This could include on-site inspections, interviews, statistical sampling, etc.
- Ensure validation assumptions are still applicable (e.g. baseline).
- Work with project operators as necessary.
- Assess the contributions to sustainable development of the host country and any other project performance criteria, as provided for in the project agreement.
- Use additional data and information from other sources as necessary.
- Provide a verification report to the Executive Board which should be made publicly available.

The verification process should be conducted by an accredited operational entity *other than the entity that validated the project under consideration*.¹⁵ Ensuring independence *between* the validation and verification processes will guard against conflicts of interest. The financial prospect of securing a consistent stream of future verification work might sway an operational entity into validating a questionable CDM.¹⁶ Towards this same end, separate accreditation processes could also be required for operational entities that wish to conduct both validation *and* verification services.

Table 4. Key Institutions: Verification

Institution	Function
COP/MOP	• Develop and approve verification standards
Operational entities	• Conduct audit and verification services • Provide verification report to Executive Board (and project participants)

¹⁵ This has been proposed by Switzerland. DNV (Det Norske Veritas), ICF Incorporated and World Bank, Technical Report, ILUMEX Lessons Learned, Report No. 99-3287, Revision No. 01.

¹⁶ See Environomics Incorporated, 1999; and Section II, page 6 for other options for addressing this concern.

Who should select the operational entity to conduct a project verification exercise is currently a matter of disagreement among Parties. The entity will either be selected by either:¹⁷

1. the project participants; or
2. the host country government.

According to G77-China, “the composition of any verification team should be approved by the Party not included in Annex I participating in the CDM project activity.”¹⁸ This idea is captured in the second option above. Government approval of operational entities could cause an unnecessary bottleneck, increasing the uncertainty and risk in CDM investing, without adding apparent environmental benefit. Nevertheless, where host countries wish to retain control over this process they can be given this option. In such cases, rather than be the subject of an international rule which all projects would be required to adhere to, the host country should ensure that the project agreement stipulates that the host retains the right to select an accredited operational entity for verification exercises.

Certification/Issuance of CERs

The independent verification process described above should serve as the basis for certification—the act through which a verified emission reduction becomes a CER with regulatory value. This process is shown in step 6 of the project activity cycle. Key elements of the certification/issuance process include:

- Certify emission reductions, based on the verification findings.
- Distribute CERs to the project participants/investors pursuant to the agreements made during financing or project design.
- Withhold a share of proceeds (in the form of CERs) to cover administrative expenses and to assist vulnerable developing country parties in meeting the costs of adaptation.
- Ensure that CERs enter the registry system and are provided unique serial numbers, which provide information regarding the project, year of issuance, certifying entity, etc.

The Kyoto Protocol stipulates that emission reductions shall be certified by “operational entities designated by the” COP/MOP (12.5). However, the expectation that accredited operational entities will undertake auditing and verification exercises (step 5) has led to some confusion over the institutional process for certification and issuance. In trying to clarify this process, Parties have elaborated three options with respect to *who* should perform certification.¹⁹

¹⁷ See Chairmen’s Text, paragraphs 180 (Proposal from the Chairmen) and 179 (G77-China and Guatemala).

¹⁸ Chairmen’s Text, paragraph 181.

¹⁹ Paragraphs 185 and 187 of Chairmen’s Text: (1) supported by Guatemala, Senegal and India (2) supported by the United States, European Union and Costa Rica and the Republic of Korea; (3) supported by Switzerland.

1. the **host Party government** in accordance with its own procedure;
2. an operational entity; or
3. the **Executive Board** of the CDM on the basis of a verification report submitted by a designated operational entity.

These options deserve careful consideration. Option 1 fails to guard against apparent conflicts of interest. Depending upon the credit sharing arrangement of the project, the host government may have a strong incentive to either over or under credit a CDM project. Indeed, the international community should take steps to ensure that developing country institutions are involved in verification and certification processes. However all operational entities should be accredited based on technical competence and impartiality. This strongly underscores the need for capacity building to ensure that a large number of operational entities are based in developing countries.

Table 5. Key Institutions: Certification and Issuance

Institution	Function
COP/MOP	• Develop and approve modalities
Executive Board	• Check verification report • Issue CERs and enter into registry system • Withhold a share of proceeds for adaptation administrative costs • Appoint another operational entity to assist in this process, as necessary

Either option 2 or 3 above could most likely confidently deliver CERs. However, like option 1, vesting certification authority in operational entities raises potential conflicts of interest. In such a case, a private sector entity could be certifying another private entity's emission reductions, making their respective revenues contingent upon one another (CERs on the one hand and certification fees on the other). Prudence might suggest that a private entity not be vested such important regulatory authorities (i.e. certification and issuance of CERs). For this reason, Option 3 is depicted in **Figure 1** and **Table 5**. Regulatory authority might be best vested in an independent *public* body, such as a standing panel of the Executive Board. This could raise the danger of bottlenecks in the certification/issuance process, and associated costs. Such costs could be at least partially avoided if the Executive Board thoroughly "checks" only a small percentage of verification reports for errors of fraudulence or incompetence.²⁰

²⁰

The US Internal Revenue Service, for example, in recent years audits about 1 percent of US taxpayers.

III. ONE CDM, THREE IMPLEMENTATION MODELS

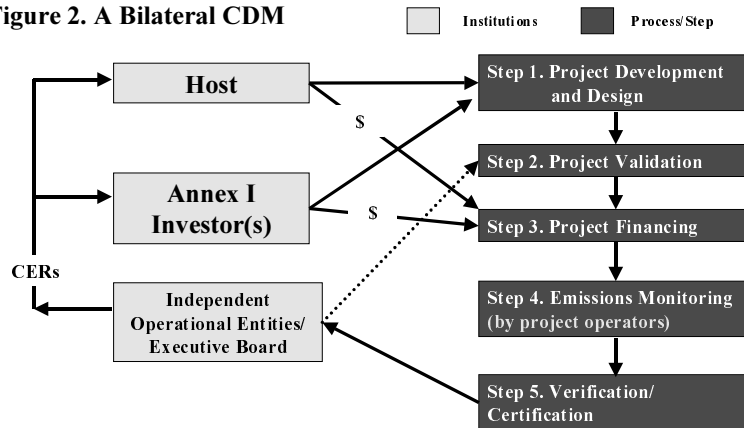
The CDM regulatory framework will require standardisation of procedures and criteria, as described above in the previous section. On the contrary, project development and financing—steps 1 and 3 of the project activity cycle—could involve more flexibility and participation from a variety of actors and institutions. These steps are the main variables in the different CDM *implementation models* advanced by countries and observers. Bilateral, multilateral and unilateral implementation models reflect different ideas of the CDM's core structure and differ significantly with respect to: (1) the relationship between project development and financing on the one hand, and the Annex I investor (i.e. the ultimate destination of most CERs) on the other; (2) host country capacity requirements; and (3) the degree of centralisation in project selection/approval.

Figures 2, 3 and 4 map three commonly discussed implementation models for the CDM: bilateral, multilateral, and unilateral.²¹ A fourth notion of the CDM is an “open architecture” mechanism that envisions all of the implementation models co-existing and operating in parallel.

Bilateral CDM

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

Figure 2. A Bilateral CDM



The private sector, many industrialised countries, and some large developing countries champion a bilateral approach. A bilateral CDM is the most consistent with conventional modes of foreign direct

²¹ For other descriptions of these models, see Farhana Yamin. “Operational and Institutional Challenges,” in Goldemberg (ed.) *Issues and Options: The Clean Development Mechanism*. 1998. UNDP; and Richard Stewart, *The Clean Development: Building International Public-Private Partnerships*. UNCTAD, October 1999.

investment, 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 specialising 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 co-operative aid programs between governments. Thus, governments may seek to advance bilaterally implemented CDM projects through existing aid programs.

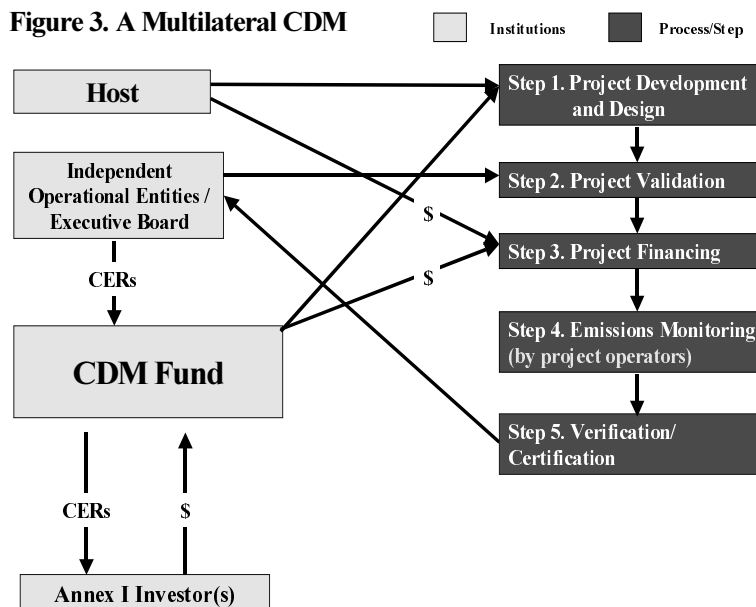
However, the bilateral model evokes two particularly important concerns of some developing countries: the *scale* of investments in a particular country or region, and the *type* of investment within a particular country. Given that most FDI to the developing world is concentrated in a handful of countries, it is unlikely that a strictly bilateral CDM would deliver a geographic distribution of projects that is acceptable to many UNFCCC Parties. Economic models suggest that up to 75 percent of CDM investment could be concentrated in China and India, where the lowest cost abatement opportunities exist.²² While such future estimates are necessarily shaky, the past AIJ experience raises the identical concerns over project distribution. Of over 125 AIJ projects, only five have taken place in Africa.²³ Because of the decentralised nature of the bilateral approach and the weak bargaining position of many host countries, 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, financing and negotiating projects 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 favour large capital intensive infrastructure projects. In contrast, small-scale efforts such as renewable energy projects may be burdened disproportionately.

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 centralised investment fund, and are channelled toward project activities in host developing countries (Figure 3). Thus, there is a clear separation between project development and financing on the one hand, and Annex I investors on the other. Once emission reductions from project activities are certified, credits would be sold or issued through a centralised body to the Annex I investors. Investors would receive a share of (or the purchase rights) the CERs proportional to their capital contributions to the fund. CDM project development would be undertaken by the fund itself, in co-operation with developing country investors and/or the host country

Figure 3. A Multilateral CDM



²² 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. November 1999.

²³ UNFCCC. FCCC/SB/1999/5/Add.1. 14 October 1999.

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. Generally, a Fund would centralise a set of important decisions, including which projects actually receive funding and the arrangements for project validation and verification services.

Many observers point to the disproportionate capacity of industrialised countries to undertake financial, engineering and legal analysis. This translates into a significant power imbalance during project negotiations when the terms for risk sharing, credit sharing, and/or CER prices are agreed. Multilateral approaches could give developing countries increased bargaining power in these areas. Instead of dealing with an Annex I corporation directly, the host country may be negotiating with a fund manager much more sympathetic to its interests, such as a regional development bank or a fund that specialises 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) or fear that they will reap a disproportionately small share of benefits from project activities.

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 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 second order issue is how many funds might co-exist simultaneously. Thus, there are two substantially different conceptions of the multilateral model described above and depicted in **Figure 3**: a single-supplier arrangement and a mutual fund model.

Single-Supplier arrangement

A single-supplier model consists of a *sole* CDM Multilateral Fund, serving as a centralised “market maker.”²⁴ Credits disbursed from a centralised entity would be the only primary market for CERs. The CDM Executive Board or other officially designated body would make project selection and resource allocation decisions.

This approach would give developing countries the greatest control over CDM investment flows within their borders. Similarly, it would be most conducive to broad geographic distribution of projects, since resource allocation decisions would be made outside the boundaries of the market. However, there are also drawbacks to this approach. Relying on a single centralised instrument could slow the market development of the CDM and create large inefficiencies. Capitalising such a Fund—a prerequisite to its operation—is also likely to be challenging. Uncertainties are extremely high, and contributing to the Fund might only appeal to a limited segment of potential CDM investors, such as governments. All things considered, the purposeful creation of a monopoly could work to the disadvantage of investors and host countries alike.

²⁴ This model is supported by the Gambia and Senegal. See Chairmen’s Text, paragraphs 167 and 168.

*Mutual Fund arrangement***Table 6. Existing or Planned Greenhouse Gas Funds**

Fund Name	Investment Focus	Fund Manager	Current or Prospective Sources of Capital	Size (\$US m.)
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 Company	Carbon Forest projects; US and international	Industry Association (members of Edison Electric Institute)	US electric utility companies	\$2.4
Credit Lyonnais—Arthur Andersen	Energy infrastructure; developing countries	-	-	\$400

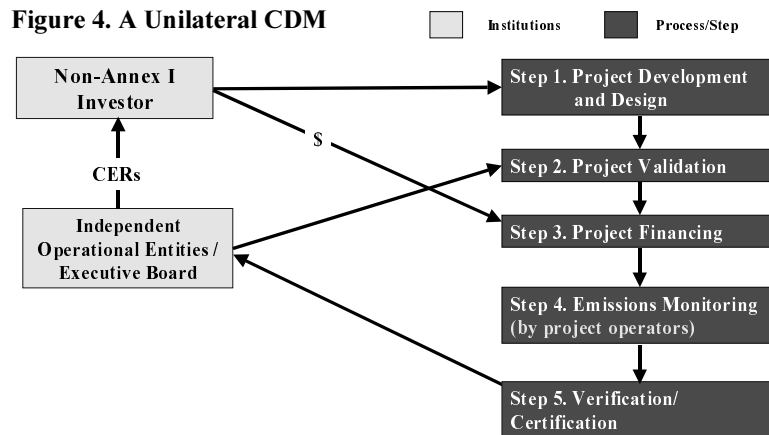
Sources: See “New funds eye carbon credits,” in *Environmental Finance*, March 2000; “Credit Lyonnais eyes carbon fund,” in *Environmental Finance*, April 2000; the Prototype Carbon Fund, <http://www.prototypecarbonfund.org/>; and Edison Electric Institute, <http://www.eei.org/issues/enviro/manus.htm>.

Note: There are many other investment funds that will support projects that reduce greenhouse gas emissions. The funds above, however, each specifically aim to generate offsets from projects.

A multilateral CDM need not be entirely centralised. The second conception of the multilateral model, which lessens some of the shortcomings of a single-supplier approach, envisions many competing and co-existing CDM Funds operated by a variety of institutions. Early examples include the World Bank's Prototype Carbon Fund and other initiatives shown in **Table 6**. Here, multiple CDM Funds 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 6**, different Funds might offer regional or project specialisation, and could assist in project financing through equity, debt or grant-based financing. CDM Funds could be initiated and administered by regional development banks, industry associations, non-governmental organisations, private sector entities, governments, or other financial institutions.

Unilateral CDM

The defining feature of a unilateral CDM is the absence of an Annex I entity in the development and financing of a project (**Figure 4**).²⁵ Such a model places project development and finance, as well as its associated risks, entirely in the realm of the host country. Non-Annex I Parties would be free to develop and fund domestic activities that lead to additional emission reductions. Once certified, emission reductions from these activities would accrue directly to the host country. The non-Annex I country could, in turn, sell CERs to interested Annex I corporations or governments. In this case, prices would likely be negotiated directly between buyer and seller. Alternatively, CERs from unilateral projects could be auctioned through a centralised fund-type instrument that might operate under the supervision of the CDM Executive Board (see discussion in IV below).



Generally, a 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 (e.g. as advanced by Mexico and Costa Rica).²⁶ Numerous bilateral and multilateral capacity building initiatives are already underway to create such capable national CDM institutions and a pipeline of viable CDM projects. These initiatives will facilitate unilateral CDM projects as well as help to ensure that CDM project activities are closely knit with national sustainable development plans.

However, this implementation model is not conducive to countries that are in need of up-front capital for implementing projects, or lack project development and implementation capacities. It is likely that international assistance for capacity building will not sufficiently extend to all interested developing countries, particularly in the early stages of the CDM market. The host country would further bear the project design, monitoring, and certification costs inherent in the CDM under a unilateral system.

Open Architecture CDM: A Flexible Implementation Model

At present, various Parties are expressing strong preferences for one or another of the models. Different models fit the needs, or perceived needs, of different countries. The question at hand is: do Parties really require exactly what each has proposed, or can a more open architecture, one that supports all three models, best satisfy Party needs? In principle, multiple variations of the CDM's core structure could co-exist. Nothing in the Kyoto Protocol precludes the above described models, or their co-existence. The only model presented above that precludes others is a multilateral CDM under a *single-supplier* arrangement, a highly centralised design of the CDM that would require all financial resources from Annex I countries to be disbursed centrally.

²⁵ 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 the UNFCCC submission of Mexico on the CDM, FCCC/SB/1999/MISC.3/Add.4.

²⁶ See Costa Rica's Certifiable Tradable Offset (CTO) system, and the UNFCCC submission by Mexico on the CDM, FCCC/SB/1999/MISC.3/Add.4.

Table 7. 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 ²⁷
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	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
Brokers or other "sophisticated intermediaries" ²⁸	Match buyers and sellers; develop secondary markets; aggregate CDM projects into portfolios	Commercial interests

An open architecture CDM envisions the three different core structures described above operating in parallel—bilateral, multilateral-mutual funds, and unilateral implementation models. This approach, however, would not *obligate* any country to participate in the CDM in any particular fashion, but would rather enable a choice of one or more channels of participation, according to their national circumstances and preferences. This is particularly important at this early stage of the development of the CDM, as such an approach offers the best hope of learning-by-doing—gaining practical experience with a menu of approaches that suit the circumstances of different stakeholders. A well developed regulatory framework (see section I), ensures that the COP/MOP can review experience and adjust according to lessons learned.

²⁷ See Stewart, 1999.

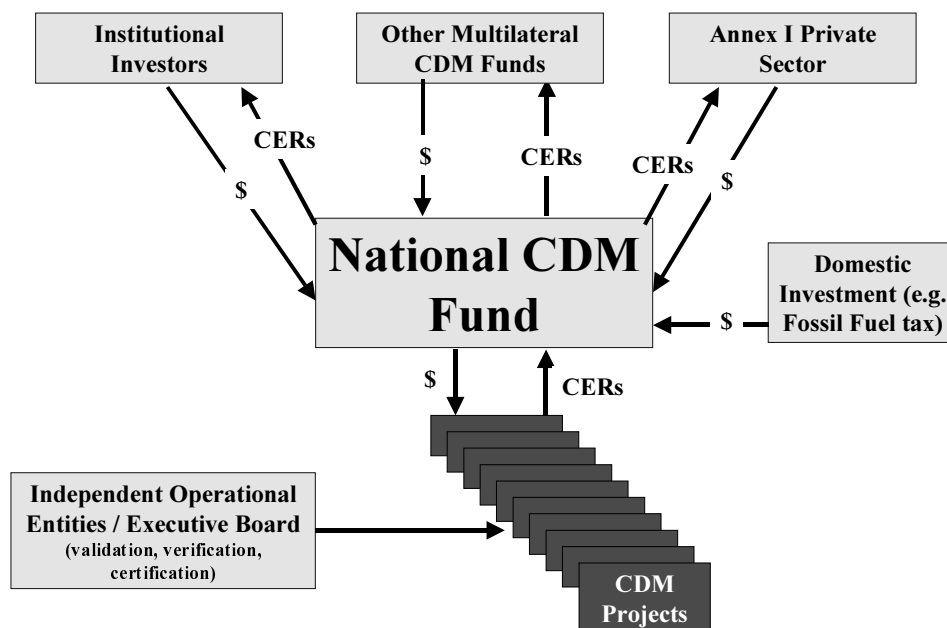
²⁸ This notion was advanced by Sid Embree at a CDM Workshop held at the World Resources Institute, 7 April 2000.

Open architecture can also accommodate a “hybrid” CDM that combines different features of the three models in a single instrument. **Figure 5** shows a domestically-oriented CDM Fund, which combines important elements of the multilateral and unilateral approaches discussed above. This approach has a *multilateral* character, in that funds (from Annex I or domestic sources) are allocated to a portfolio of CDM projects through a centralised mechanism. However, all project selection and development occurs through domestic processes, giving it a strong *unilateral* flavour. This approach is consistent with many existing and planned national Environmental Funds, such as those in Costa Rica (**See Box 1**).

An open architecture CDM appeals to a wide variety of potential CDM participants (**see Table 7**). Taken alone, any of the individual investment structures may foreclose options for participation of some market participants. A flexible approach also appeals to a wider array of developing countries which vary significantly with respect to their preferences for CDM project types, abatement costs and institutional capacities. A purely bilateral or unilateral CDM might in effect exclude some developing countries.

The importance of attracting CDM attention to wide variety of actors extends well beyond the immediate efforts to protect the climate system and develop the CDM market. In order to solve the problem of climate change over the longer term, investors of all types must begin to factor greenhouse gas considerations into decision-making processes. Currently, only a very limited number of companies are doing this. The CDM could help raise a broader awareness that companies (and countries) may benefit commercially from reducing emissions in the near term, and will increasingly be held accountable for their own emissions over the longer term.

Figure 5. Hybrid CDM Model (National Fund)



Box 1. Environmental Funds

Environmental Funds emerged in the last decade as potentially significant mechanisms for financing sustainable development, biodiversity conservation, environmental education and other capacity building projects. Many Environmental Funds were originally created to manage the substantial resources generated from debt-for-nature swaps in the 1980s and 1990s. Although Environmental Funds are tailored to the unique circumstances of individual countries and environmental goals, they typically have several common features:²⁹

- The ability to receive money from a variety of sources. The most common sources of fund capitalisation are bilateral and multilateral donor agencies (e.g. US AID and Global Environment Facility) and national governments, through resources use/pollution fees levied national level.
- Management by a Board of Directors. The Board—which makes key decisions regarding project selection criteria, asset management, etc.—is often comprised of a diverse groups 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.

Environmental Funds may be structured financially as endowments (e.g. the Fund for Natural Areas Protected by the State in Peru); sinking funds, which re-channel their entire principal and investment income over a fixed period of time; and revolving funds, which are replenished on a regular basis either through new tax revenues or loan repayments. It is important to note, however, that Environmental Funds are more than just financial mechanisms. 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. Perhaps most important in a CDM context, Environmental Funds can help shape sustainable development priorities and national implementation strategies.³⁰

One example of a well established Environmental Fund is the Mexican Nature Conservation Fund (FMCN), dedicated to biodiversity conservation and sustainable natural resources use. FNMC is composed of an 18-member board of directors representing broad geographic and civil society representation. The FNMC Board disburses small grants on a competitive basis for field-based conservation activities (including to NGOs and community groups) as well as to cover operating costs of protected areas. The grants come from the approximately \$2 million per year investment earnings of the fund's endowment (originally capitalised in 1994 with \$19.5 million from US AID and \$10 million from the Mexican Government) and an additional \$16.5 million received by the GEF in 1998.

Either by establishing a “CDM window” in an existing fund, or chartering a new fund, Environmental Funds could provide an attractive CDM financing instrument. Because some Environmental Funds have already identified a set of national sustainable development priorities, and are established for building capacity and implementing projects toward these ends, they are consistent with CDM needs. By working with project developers and the national CDM authorities, a Fund could support a portfolio of small-scale CDM projects to promote sustainable development. The attractiveness of combining CDM aspirations with national Environmental Funds will largely depend on the extent to which CDM opportunities overlap with a country's sustainable development priorities and whether Environmental Funds, through CDM projects, could attract significant new sources of public and private investment. Several such possibilities are shown in **Figure 5**, including investment from other international funds, such as those with CDM objectives. For example, the World Bank's Prototype Carbon Fund 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.³¹

²⁹ See Kyle Danish. “National Environmental Funds,” in Werksman (ed.) *Greening International Institutions*. Earthscan Publications Ltd. London. 1996.

³⁰ R. Bayon, C. Deere, R. Norris and S. Smith. *Environmental Funds: Lessons Learned and Future Prospects*. IUCN. 1999. Available: <http://economics.iucn.org>.

³¹ Prototype Carbon Fund. *Project Idea Note*, Costa Rica Fund for Renewable Energy of the Ecomarkets Project. Available: <http://www.prototypecarbonfund.org/>.

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

There are of course many methodological and institutional issues that must be decided by the Parties in order for the CDM to operate effectively. This section addresses an important *subset* of those issues and the political decisions that are important to shaping an environmentally sound open architecture CDM that is conducive to the needs and interests of various stakeholders. In this limited context, Parties and observers may be concerned with the following issues:

- Competitiveness: the CDM vs. other Kyoto Mechanisms.
- Definition of a CDM project.
- Role of government financing of CDM projects.
- The mandate and role of the CDM Executive Board.

These cross-cutting issues can affect, and/or be affected by, the nature of the CDM regulatory framework and the various implementation models of the CDM.

Competitiveness: the CDM vs. other Kyoto Mechanisms

Several Parties have expressed concern that the CDM not be disadvantaged vis-à-vis the other Kyoto Protocol mechanisms; or that the “value” of CERs be consistent with the value of parts of assigned amount units (PAA) exchanged through International Emissions Trading and emission reduction units (ERU), traded through Joint Implementation. How might CDM design issues affect this important issue?

Table 8 shows the potential size and market share of the CDM according to several well known economic models. According to the models, the CDM could account for a significant proportion—between 31 and 55 percent—of the total abatement effort required by the Kyoto Protocol. A full assessment of the competition between different Kyoto Mechanisms is not possible here, and would depend upon a number of factors—including

Table 8. Estimated Size and Market Share of CDM Activities in 2010

Model	CDM Activity	
	Tons (MtC)	Percentage of Total Market
OECD-GREEN	397	31
G-Cubed	495	45
Second Generation	454	43
EPPA	723	55
Zhang	292	47

Source: ZhongXiang Zhang, 1999.

Notes: These figures are, of course, highly uncertain. They reflect optimum market conditions and no transaction costs. They do not factor in any particular requirements that may be adopted by the Protocol Parties. For example, model results assume no rules that would limit transfers or acquisitions of units under the Kyoto Mechanisms.

The year 2010 is taken to be representative of the (2008-2012) commitment period. Percentage of the Market refers to the amount of emission reductions undertaken through the CDM relative to other abatement options, either domestic or through Kyoto Mechanisms.

emission reduction requirements in future budget period—that are beyond the scope of this work. Nevertheless, some observations about price and competition will help show how rules that support a plurality of CDM implementation models and a credible regulatory framework are likely to best enhance this mechanism’s competitive position in relation to Joint Implementation and International Emissions Trading.

First, the Kyoto Protocol establishes that CERs, ERUs, and PAAs are equivalent for the purposes of Annex I compliance.³² None is given special preference, and provided they are denominated equally (e.g. one metric ton of CO₂ equivalent), then all units may to be used equally by Annex I Parties toward their emission obligations. *Thus, if there were no risks associated with holding any the various units, their relative market values should be equal.*

However, there is reason to believe that the risks associated with the three units—CERs, PAAs, and ERUs— may not be identical. Holding a CER from a validated CDM project, which is independently verified and certified, may be perceived as less risky (and therefore have a greater market value) than purchasing a PAA from a country that is in danger of exceeding its Kyoto target. For units transferred through Joint Implementation, the Kyoto Protocol already contains a liability rule: if the compliance of a Party transferring an ERU is found to be questionable, the Party acquiring that ERU *cannot* use it to fulfil its own obligations until the question of compliance is resolved (i.e. buyer-beware).³³ Thus, overall, the prices of the various units will reflect the rules of liability agreed to by the Parties. Once these rules have been established, the relative prices of CERs, ERUs, and PAAs will reflect the perceived risks associated with the respective units. At this stage, it appears that CERs from any developing country will be less risky than ERUs and PAAs from some countries, such as those with economies in transition.³⁴

Calls for putting the three mechanisms on “equal ground” should consider these fundamental market features (risk vs. reward), as well as a few other factors. In particular, many believe that adaptation and administration fees (which are required for the CDM) should also be levied on Joint Implementation and International Emissions Trading. There may be compelling reasons to do this, such as the need to generate greater adaptation assistance resources. However, levying fees across all mechanisms will not equalise the attractiveness of the three mechanisms, or the market prices of their respective units. All other things equal, these fees and the costs inherent in the CDM regulatory framework will make the CERs more expensive to generate. But all other things are not equal. Unlike either International Emissions Trading or Joint Implementation, the CDM is able to generate credits from 2000 to 2007, giving it an unparalleled head start.

Equally important, the CDM regulatory framework is unique to this mechanism. Although these requirements may be time consuming and costly relative to other Kyoto mechanisms, they provide more certainty to the integrity and validity of the unit traded, relative to International Emissions Trading and Joint Implementation. Since this actually serves as a competitive advantage, it underscores the importance of a clear and credible regulatory framework outlined in section II.

³² Article 3 paragraphs 10-12 of the Kyoto Protocol.

³³ Article 6.4. 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.

³⁴ This, however, will depend upon the rules of liability for International Emissions Trading. For options, see Chairmen’s Text Part IV.

So how do various CDM implementation 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 many fewer projects. Restricting the CDM to any of the other individual models will also result in a less attractive mechanism. As noted, an open architecture CDM is able to accommodate a potentially diverse group of investors from Annex I and non-Annex I countries alike: small companies, large multinational corporations, companies with and without project implementation experience, governments agencies, institutional investors, etc (see **Table 7**). This appeal will increase the attractiveness of the CDM relative to other mitigation options under the Kyoto Protocol.

Project Boundaries: What is a CDM Project?

Article 12 of the Kyoto Protocol refers to *certified projects activities*, but does not specifically define what constitutes a “project.” In order to create an open architecture CDM that interacts smoothly with the regulatory framework, two aspects of the definition of a project merit special consideration.

First, 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. Broadly defining projects to include such macroeconomic and other policy measures may enable countries to claim credits through the unilateral implementation model for any number of programs or policies that lead to greenhouse gas reductions. Crediting these kinds of policy-based measures could potentially generate an enormous quantity of CERs in non-Annex I countries, collapsing the market price of CERs and substantially eroding any incentives for Annex I countries to undertake domestic action and invest in alternative technologies. Crediting policy-based measures could create the harmful incentive for developing countries to take no common sense emission reduction actions *unless* they are credited through the CDM.

Second, other ideas of “project” activities are limited to a single discrete activity with very narrow bounds. Too narrow a definition of a project will disadvantage small-scale projects and militate against the bundling of many small-scale activities. 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.³⁵

The COP/MOP could take steps to safeguard against either of these extremes which may be harmful to the development of an open architecture CDM. Realistically, crediting climate-friendly domestic policies like carbon taxes or deregulation should fail either the “measurable” or “additional” requirements of the CDM. After all, because of macroeconomic, health and other benefits, many developing countries are already implementing these sorts of climate-friendly policies, even without earning credits.³⁶ And the larger the “project” boundaries (e.g. entire economy or even international), the more uncertain emission reduction measurements become.

If COP/MOP additionality and other standards cannot ensure that these projects are ineligible, Parties could require a project to have discrete boundaries (i.e. confined to a particular technology or area) for project validation, or explicitly define what constitutes a “project activity.” Ideally, however, methodological and other project criteria would be crafted in such a way as to include bundled small-scale

³⁵ As proposed by Mexico. See paragraph 145 of the Chairmen’s Text.

³⁶ W.V. Reid and J. Goldemberg (eds), *Promoting Development While Limiting Greenhouse Gas Emissions: Trends and Baselines*. UNDP and WRI, 1999.

projects. Sampling and conservative estimations techniques have already been tested in pilot verification exercises.³⁷

Role of Government Financing

Industrialised country governments are likely to play a variety of roles in supporting CDM implementation.³⁸ **Table 9** shows a range of CDM activities that could be supported by the public sector, including capacity building and project financing. According to the Kyoto Protocol, public entities may “participate” in CDM projects, including “in the acquisition of certified emission reductions” (Article 12.9). However, the exact character of that participation, the text continues, is “subject to whatever guidance may be provided by the executive board of the clean development mechanism.” The AIJ pilot phase, as well as the positions of many Parties in the Kyoto Protocol negotiations, further affirm that projects should be “additional to ODA, GEF and other financial commitments of the developed country Parties.”³⁹ So what should be the character of public sector financing, and can various implementation models be helpful in defining the bounds of public sector financing?

Table 9. Range of CDM Activities that Could be Supported by Public Financing

Government Financing Activity	Use ODA?	Earn Credits?
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 an “Equitable Distribution Fund”	Undecided	Undecided
Use of officially supported export credits	No	Undecided
Bilateral Financing of CDM Activities	Probably No	Undecided

Two critical questions are undecided: can Annex I governments earn CERs by *directly financing CDM projects*? If so, can this financing come from official development assistance (ODA) accounts? Factors that can help assess these public sector financing questions include the existing experience with ODA additionality; the profile of existing public and private financial flow recipients; and the existing guidelines that govern government financing. Taken together, these factors suggest that government financing in the CDM:

- will not be influenced by an additionality criterion (nor will an ODA additionality arrest declining aid flows);
- should focus on capacity and CDM institutional building activities;
- should directly finance projects only in limited cases; and
- should focus on the least developed countries which do not receive private international capital flows.

³⁷ See “The Ilumex Verification and Certification Pilot Exercise: Objectives, Results and Lessons Learned.” World Bank – Norway Collaboration on AIJ. 30 July 1999.

³⁸ 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.”

³⁹ See paragraph 148 – 151 of the Chairmen’s Text.

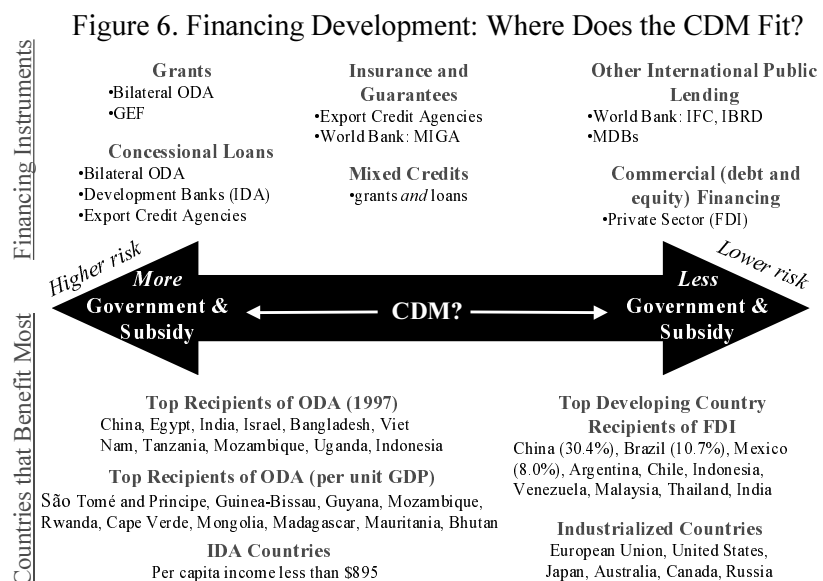
First, the question of ODA additionality is particularly important to developing countries, as the CDM could potentially divert official development assistance toward credit generating activities and away from other worthy development objectives. In 1998, the G-77 and China asked how it will “be ensured that financing for CDM projects shall be additional to ODA and other international funding” obligations. In response, both the European Community (with Switzerland) and the United States asserted that these issues would not arise because the CDM will primarily be a vehicle for private sector investment.⁴⁰ These responses have not assuaged many observers, and the role of ODA and other forms of public financing has not been resolved. Whether the ODA additionality issue will arise, however, is a moot question. Unfortunately, the presence of such a criterion lacks any operational meaning, since there is no agreed upon *ODA baseline* from which to assess additionality. Thus, some Parties, both industrialised and developing, generally support the use of ODA funds in CDM project financing, recognising that without ODA or other public financing, many countries will not receive any project investment through the CDM.

Another important question is which countries currently receive various international financial flows? **Figure 6** shows a broad spectrum of development financing instruments with respect to the level of public involvement. At one extreme is ODA, in the form of grants—an entirely public enterprise. At the other extreme is foreign direct investment which has an entirely private character. Between these extremes are other instruments used by government agencies, multilateral development banks and other financial institutions, including “soft loans,” mixed credits and other forms of concessionary financing. Along this same spectrum lie different sets of countries that are typically served by the different financing instruments. For example, a large majority of FDI typically takes place between industrialised countries and a small set developing countries, with China, Mexico and Brazil receiving over

Table 10. Global Distribution of Aid Flows (Official Development Assistance)

Country/Region	Net ODA Received, 1997	
	Total (\$US mil.)	% of GDP
All Least Developed Countries	13,041	11.1
Sub-Saharan Africa	13,726	6.7
Latin America and the Caribbean	5,265	0.5
South-East Asia and the Pacific	4,152	0.5
South Asia (excluding India)	2,657	1.9
China	2,040	0.2
India	1,678	0.4
East Asia (excluding China)	96	0

Source: *Human Development Report 1999*. Aid and Debt by Recipient Country. Table 15. United Nations Development Programme. 1999.



⁴⁰

See FCCC/SB/1998/MISC.1/Add.6 (for the EU and Switzerland), Available: <http://www.unfccc.de>, and *Responses to G-77/China Questions on Flexibility Mechanisms*, September 10, 1998, U.S. Department of State, Available: http://www.state.gov/www/global/global_issues/climate/doc-g77_china_980910.html.

50 percent of all flows to the south.⁴¹ With respect to aid, the African countries and other least developed countries are the largest recipients (see **Table 10**). With these polarities in mind, where does the CDM fit?

Box 2. OECD Aid “Rules”: ODA and Tied Aid

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 Official Development Assistance (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.
- ♦ Are on concessional terms, having a grant component of at least 25 percent.

Those flows which do not meet these criteria are not 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 is not the main objective of such investments.

“Tied aid” is also subject to OECD guidelines.⁴² These flows include loans, grants or other associated financing packages that are conditional upon the procurement of goods and/or services from the donor country. OECD rules restrict the use of tied aid to projects that:

- ♦ Have at least a 35 percent grant element (50 percent for *least* developed countries)
- ♦ Are financially *non-viable*
- ♦ 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 non-viable. 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.

When addressing the subject of public financing and the CDM, it is equally important to consider existing international guidelines that govern the use of official aid (see **Box 2**). According to the OECD, while limiting trade and aid distortions, the purpose of such rules is to “target much needed external resources to projects and to countries with limited or no access to market financing.”⁴³ An evolving “best practice” of official aid also suggests that government resources might be best channelled away from credit earning project activities and toward building market infrastructure and institutional capacity in developing countries.

These factors—experience with ODA additionality, existing financial flows, and international aid rules—suggest that limited aid resources should be used in only limited ways for the CDM. Addressing these difficult questions through the lens of various CDM implementation models may help Parties determine appropriate roles for public sector investment in the CDM. Of course, any of the CDM implementation models outlined above are conducive to government financing. However, if allowed at all, government financing of *credit-earning activities* might be more palatable if it is channelled through one or more multilateral CDM Funds. For example, Annex I government could be encouraged to contribute to the

⁴¹ *World Investment Report: 1999 Foreign Direct Investment and the Challenge of Development*. UNCTAD. United Nations, 1999. See Annex Table A.I.1.

⁴² *Arrangement on Guidelines for Officially Supported Export Credits*. Chapter III: Provisions for Trade-Related Aid. See www.oecd.org; and *Ex Ante Guidance For Tied Aid*. OCDE/GD(96)180. OECD, Paris, 1996.

⁴³ *Ex Ante Guidance For Tied Aid*. OCDE/GD(96)180. OECD, Paris, 1996.

national CDM Funds of least developed countries or other multilateral instruments that have explicit “fund objectives” that serve broad geographic goals. These would be easy to verify and operationalise relative to the additionality tests for ODA or other sources of public funding. Rather than allowing aid resources that are tied to donor procurement to flow to commercially attractive countries and projects, limiting aid to this type of project financing would also be consistent with OECD guidelines, which attempt to ensure, the “best value for money” when aid is used.

The Mandate and Role of the Executive Board

An Executive Board is expected to supervise the Clean Development Mechanism. What this means in practice is becoming increasingly clear, although there are many undecided issues. Together, the CDM regulatory framework as well as an open architecture CDM that explicitly pursues equity goals suggests an important and multifaceted role for the Executive Board.

CDM Regulatory Framework

One facet of the Executive Board’s responsibility will be to intervene in, and facilitate, the regulatory process, as discussed in section II. These functions, included in the description of the CDM regulatory framework above, will include:

- Developing and overseeing the accreditation process for operational entities.
- Reviewing the validation and verification work of operational entities.
- Suspending the right of an operational entity to perform validation and verification services, as necessary.
- Registering CDM projects.
- Certifying emission reductions and issue CERs.
- Withholding a share of proceeds (in the form of CERs) to cover administrative expenses and to assist vulnerable developing country parties in meeting the costs of adaptation.
- Make CDM project information publicly available.
- Disseminate methodological standards, crediting procedures, and other project criteria.

CDM Project Implementation and Financing

A second major role of the Executive Board will be in assisting in project implementation and financing. The Kyoto Protocol specifically calls on the CDM to “assist in arranging funding for certified project activities as necessary” (Article 12.6).⁴⁴ Parties have not yet decided how to translate this language into practical terms. Several ideas have been put forth which, to varying degrees, are conducive to the different

⁴⁴ Although not stated specifically in the Kyoto Protocol, many envision the Executive Board of the CDM undertaking these various roles.

CDM implementation models sketched in section III. Taken together, these could represent a suite of measures to promote sound projects under the various CDM implementation models.

Some have suggested that the CDM Executive Board provide a *clearinghouse and information centre* for project opportunities. This is particularly compatible with a bilateral CDM, as 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.⁴⁵

Rectifying the geographic imbalance of project activities, noted above, without arbitrarily constraining CDM activity will be a challenge to the Parties. The mandate of the Executive Board could be shaped to address this challenge. Within the context of a multilateral model, the Board could create or facilitate 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 proposed by the African countries.⁴⁶ 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). Such a Fund could also assist in the formulation of projects in the least developed countries (as well as support projects initiated unilaterally by non-Annex I Parties) and seek financial support from interested governments, corporations and other investors. By bundling projects together in a portfolio, a Geographic Distribution Fund could reduce the substantial risk (and therefore increase the viability) of CDM investments in commercially unattractive least developed countries. The central challenge to such a fund would be attracting sufficient financial resources. One or more geographic funds could provide an appropriate channel for public sector investment, as discussed above.

Another way the Executive Board could help fulfil the mandate of Article 12.6 is to *develop guidelines and provide assistance for other CDM Funds*. A “template” for the administrative structure, and perhaps even equity guidelines, 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. Several developing countries have expressed interest, or experimented with, revolving funds at the domestic level that would support small-scale CDM projects, and be replenished with the subsequent sale of CERs.⁴⁷

Vesting power in the CDM to *auction CERs* would support all approaches, but especially the unilateral model and non-Annex I countries that develop projects under that model. Auctions indirectly assist many financing activities by reducing uncertainty and providing essential information to investors about the market price of CERs. Periodic centralised auctioning would serve broader purposes and interests as well. Most notably, the CDM could auction a portion of CERs from all projects to generate the administrative and adaptation proceeds called for in Article 12.8 of the Kyoto Protocol. This, in turn, would also provide added liquidity to the CDM market and help secondary markets develop.

Finally, Article 12.9 Kyoto Protocol already gives authority to the Executive Board to provide guidance on participation of public and private entities in the CDM. 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 take

⁴⁵ To a limited extent, this is being undertaken by the FCCC Secretariat in the AIJ phase. See UNFCCC. “Offers of Activities by Parties.” Available: <http://www.unfccc.de/program/aij/aijoff.html>.

⁴⁶ Chairmen’s Text, paragraph 169, Equitable Distribution Fund.

⁴⁷ See Costa Rica’s CTO system, and the UNFCCC submission by Mexico on the CDM, FCCC/SB/1999/MISC.3/Add.4.

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 developed by the OECD for tied aid.⁴⁸

Delegation of Responsibility

The Executive Board is expected to be small (10-20 members) and meet several times a year. Thus, it is highly unlikely that the Executive Board would itself perform all of these functions. However, it could appoint and oversee other suitable agents, or form smaller panels, to act on its behalf. This will be essential to a well functioning CDM. Currently, the draft text of the mechanisms decision includes such enabling 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.”⁴⁹ Parties will need to further consider *which* responsibilities the Board can and cannot outsource.

⁴⁸ *Arrangement on Guidelines for Officially Supported Export Credits*. Chapter III: Provisions for Trade-Related Aid. See www.oecd.org; and *Ex Ante Guidance For Tied Aid*. OCDE/GD(96)180. OECD, Paris, 1996.

⁴⁹ Chairman’s Text, paragraph 219(p)(m), supported by the European Union and other Parties.

V. SUMMARY AND CONCLUSION

Three main implementation models are commonly advanced by Parties and observers. A bilateral model is characterised 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 on the one hand and investment from the Annex I sources on the other, by channelling investment through a centralised mechanism. A multilateral CDM typically pools many project activities together, presumably lowering risk and transaction costs. The unilateral model relies on the host country to develop and finance projects on its own. CER proceeds from “unilateral projects” could subsequently be sold to Annex I investors.

While often presented as conflicting, there is no inherent reason why these models cannot co-exist and operate in parallel, through an “open architecture” approach. An open architecture CDM would also encourage hybrid approaches that combine elements of different implementation models. 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, make the CDM less competitive relative to other Kyoto Mechanisms, as well as deliver benefits to a more narrow group of countries and investors. While an open architecture CDM will best deliver on the extremely high expectations placed on this mechanism, its creation will not be spontaneous. Decisions facing the Parties – including on public finance and the role of the Executive Board—may best be made with an open architecture orientation in mind.

Perhaps most important, an open architecture CDM would not place the CDM in environmental peril. The environmental integrity of the mechanism is rooted in the regulatory framework that any project must operate within, regardless of the implementation model. Such a framework should be guided by the mutually reinforcing objectives of environmental integrity, transparency and investor confidence.

Many positions of Parties and observers differ regarding the intricacies of this framework. Particular areas of divergence include:

- the nature of the accreditation process for operational entities;
- whether projects should be *registered* with the Executive Board before implementation;
- whether the same operational entity should conduct validation and verification exercises for a single project;
- the role of local groups and potentially affected communities;
- who selects the operational entity to conduct emission reduction verification;
- which entity certifies emission reductions and issues CERs; and
- which responsibilities the Executive Board can delegate to other institutions.

These areas deserve further analysis and exploration. Several of these issues deal with the institutional responsibilities of the Executive Board relative to those of accredited operational entities: should accredited operational entities *or* the Executive Board be primarily responsible for the project validation/registration and emission reduction certification? These are regulatory activities, the result of which will be the creation of units that Annex I Parties will be able to use to demonstrate compliance with international obligations. The extent to which private (i.e. operational) entities can acceptably undertake them will, at least in large part, depend upon the oversight and accreditation of operational entities by the Executive Board. A more prudent approach may be to have operational entities undertake the bulk of the work during these steps, but have the Executive Board—an independent public body—actually “sign off” on the regulatory steps. Balancing needs for regulatory credibility and bureaucratic minimisation will be central to resolving these questions.

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