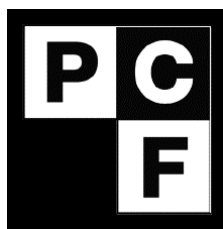


## **Lessons learned**

# **LEARNING FROM THE IMPLEMENTATION OF THE PROTOTYPE CARBON FUND**

**October, 2000**



**Prototype Carbon Fund Occasional Paper**

**The World Bank**

Work in Progress  
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## LEARNING FROM THE IMPLEMENTATION OF THE PROTOTYPE CARBON FUND<sup>1</sup>

### SUMMARY OF KEY FINDINGS

The Prototype Carbon Fund (PCF) is a private-public partnership that aims to mobilize new and additional resources to address climate change and promote sustainable development. In addition, the PCF aims to provide an opportunity to “learn by doing” in the development of policies, rules and business processes for the achievement of emissions reductions under CDM and JI.<sup>2</sup> The PCF believes that substantial learning will result from identification, preparation and approval of CDM and JI projects and intends to place funds in 15-20 projects and identify, prepare, and approve these in the first three years of its operation. The early PCF projects and other aspects of PCF operations have already provided a rich learning experience including the following:

- The full potential of CDM and JI can only be realized by allowing markets to develop and operate efficiently;
- The procedures implied by the CDM project cycle that is currently being negotiated will discriminate heavily against small projects financed under CDM arrangements due to high transaction costs;
- Determining environmental additionality of projects generating emissions reductions remains the main methodological challenge;
- It is crucial that developing country needs for capacity building – both in the public and private sector – are addressed if their sustainable development is to benefit from the CDM.

These lessons are elaborated in more detail in the following paragraphs and the attached paper.

### Markets in Emissions Reductions will promote CDM/JI Investments

#### ***Conceive CDM deals as a purchase of emissions reductions (p. 16)***

CDM and JI are unique amongst global environment financing mechanisms in that they foresee vastly larger scale funding and seek to mobilize private investment around a new commodity (“greenhouse gas emissions reductions”). Facilitation of thousands of private sector transactions requires *ex post* market-based regulation of a type found in commodity markets rather than *ex ante* project by project review. A heavy-handed review process at the project finance and investment stage is not helpful, if the volume of investment required to mitigate climate change is to occur.

#### ***Allow for fungibility of emissions reductions (p. 16)***

Lack of fungibility will profoundly change the incentive to invest in CDM/JI emissions reductions. Unless fungibility is allowed, investors will be unable to place certified emissions reductions in the highest value Annex I country regime year by year, and reallocate them as needed. In addition, the advantages many investors seek by pooling their capital in funds to

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<sup>1</sup> Views expressed in this document are those of the PCF Fund Management Unit staff and do not necessarily represent the views of the PCF Participants, or the World Bank.

<sup>2</sup> Clean Development Mechanism and Joint Implementation as defined in the Kyoto Protocol.

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spread risk and lower transaction costs will be largely eliminated as investors will be unable to allocate and reallocate their share of a projects' emissions reductions to the Assigned Amounts of their preferred Annex I country.

***Consider non-domestic emissions reductions (p. 13)***

Being unable to capture the benefits of emissions reductions achieved in countries other than the one in which the JI project is located, such as by displacing imported fossil fuel generated power, reduces the incentive to invest under JI and may raise political concerns under CDM.

***Allow for quick decision-making (p. 13)***

Emissions reductions are invariably the minor product and revenue source in energy, industry and transport infrastructure investments. Hence, an efficient and time-bound decision cycle, which quickly establishes the eligibility and level of possible carbon financing, is critical. Such efficient decision-making on carbon finance does not get in the way of dominant private sector investment decisions, and thus, ensures that private investment will flow to CDM and JI projects, as opposed to more carbon-intensive, business-as-usual activities.

***Accredit private sector Operational Entities (p. 14)***

There is sufficient depth in the private sector globally to play the role of Operational Entities for validation, verification and certification. Moreover, many precedents exist in market regulation for efficiently establishing and maintaining high practice standards. To take advantage of this capacity, the Parties would need to provide clear guidance on standards, and insist on professional accountability and liability for negligence in the event of non-compliance.

**Small projects need help**

***Don't disregard transaction costs (p. 7)***

For projects that are less than US\$2 million in emissions reductions financing, and about US\$8-10 million in total financing, the transaction costs of applying the proposed CDM project cycle adds significantly to the cost of emissions reductions, which makes them less attractive than large scale projects with high emissions reductions volumes.<sup>3</sup> For most developing countries the majority of their opportunities to participate in the CDM is through projects with a carbon finance component worth less than US\$2 million.

***Crediting period for projects matters***

The crediting period influences the cost of emissions reductions from different technologies. Shorter crediting periods have higher cost implications for technologies with longer project life and higher up-front costs, which are typical of renewable energy technologies. The shorter the crediting period, the higher is the cost of emissions reductions from renewables. Shorter crediting periods also make options with short pay-back period, such as energy efficiency, more attractive.

***Promote "established intermediaries" (p. 7)***

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<sup>3</sup> PCF aims for a portfolio price outcome of \$20 per ton of Carbon at the termination of the Fund in 2012. The implications on transaction costs are based on this price assumption. Lower market prices would imply higher transaction costs as a proportion of the total project financing, thereby making small projects less viable.

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Using private sector intermediaries to bundle small projects to aggregate emissions reductions, thereby lowering transaction costs, is an effective means of enabling small projects and small economies to participate in the global emissions reductions market. The modalities for CDM and JI should facilitate this intermediation function.

***Streamline procedures (p. 9)***

Streamlined procedures for establishing/validating baselines, for developing monitoring and verification plans (MVP), and for performing verification and certification for small projects, such as rural renewable energy supply, are critical to enable them to benefit from CDM investment. Establishing multi-project baselines and MVPs, as well as simplified procedures for validation and verification, is one such option. Sectoral baselines for integrated power grids greatly facilitate and promote local investment in small scale and renewable power generation capacity.

***Standardize the validation and verification process (p. 13)***

The costs of validation can be lowered significantly if a simple validation protocol is developed, which requires only the information that bears directly on the environmental credibility of the baseline and the monitoring and verification plan.

**Environmental additionality remains a challenge**

***Investment analysis is only one possible baseline method (p. 11)***

PCF's experience suggests that environmental additionality should be the key determinant for credible projects, and that project credibility must be demonstrated by developing a credible baseline. Investment analysis and the use of control groups are important, but not the only methods for determination of a credible baseline. Standardization of baselines, such as agreed benchmarks and multi-project baselines, can greatly facilitate project preparation and reduce costs and uncertainties.

***Prevent perverse outcomes (p. 10)***

Progressive countries could be penalized by being ineligible for emissions reductions financing when they have pre-existing policies that favor development of climate-friendly technology, such as renewable energy sources, where these are not the least-cost supply option. Other countries could benefit from maintaining or introducing carbon intensive policies. Current approaches to assessing "additionality" may have these perverse outcomes, therefore deserve careful thought by UNFCCC Parties in developing guidance on baselines and acceptable policies (policy baselines).

***Implement the CDM reference manual as a discovery process (p. 9)***

CDM projects are diverse and must be credible in many different policy environments. To enable an early start of the CDM and avoid overly complicated generic guidance concerning baseline determination and monitoring, the CDM reference manual should evolve with experience and on the basis of precedent.

***Development finance is second to carbon finance (p. 12)***

So long as concessional development finance does not earn emissions reductions, it can be a valuable adjunct to emissions reductions finance in supporting climate-friendly technologies with high development impact, which would not otherwise be competitive sources of emissions reductions. One example is solar photovoltaic power generation. However, in most cases,

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emissions reductions finance will displace and free up development finance for use in other socially beneficial development projects. This result is desirable as development financing should not crowd out private investment, including investment for the production of emissions reductions.

### Developing countries' concerns are important for the market

#### ***Build the right host country capacity (p. 15)***

Capacity building for emissions reductions market development has two critical components. One is building confidence with buyers of emissions reductions that governments understand the Protocol's requirements, and are willing and capable of meeting these requirements in facilitating CDM/JI transactions. The other is building the capacity of the local private sector to identify and intermediate carbon financing and assist with project preparation and supervision. Neither of the two is sufficient without the other to ensure countries can benefit from CDM/JI transactions. And both are critical to reduce risks and transaction costs and facilitate project replication.

#### ***Measure sustainable development indicators (p. 17)***

It is possible to obtain a proxy measure for sustainable development contributions of CDM/JI transactions at a small, additional cost by identifying, quantifying, verifying and certifying a limited number of other social and environmental attributes of emissions reductions activities, along with generating certified emissions reductions. This will enable governments and civil society to understand the wider development impacts of CDM/JI activities. It will also enable markets to reward certified emissions reductions which clearly result in local social and environmental benefits.

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## **LEARNING FROM THE IMPLEMENTATION OF THE PROTOTYPE CARBON FUND<sup>4</sup>**

The Prototype Carbon Fund (PCF) is a private-public partnership that aims to mobilize new and additional resources to address climate change and promote sustainable development. The PCF is capitalized in a first closing at US\$135 million as of April 10, 2000, with six governments and fifteen companies participating.<sup>5</sup> While project identification and preparation activities have been well underway for the past two years, PCF operations formally started on April 10, 2000.

The PCF has three primary strategic objectives:

- Demonstrate the potential for public-private partnership in mobilizing new resources for addressing global environmental problems through market-based mechanisms;
- Show how project-based emissions reductions (ER) transactions and trade can promote and contribute to sustainable development and lower the cost of compliance with the Kyoto Protocol; and
- Provide the Parties to the UNFCCC, the private sector, and other interested parties with an opportunity to “learn by doing” in the development of policies, rules and business processes for the achievement of emissions reductions under CDM and JI.

This note is prepared to meet the “learning-by-doing” objective of the PCF and intends to communicate the lessons learned in the outreach and the implementation process of the PCF.

The PCF believes that substantial learning will result from identification, preparation and approval of CDM and JI projects. The PCF intends to place funds in 15-20 projects and identify, prepare, and approve these in the first three years of its operation. The initial set of projects is being identified and prepared by the World Bank. IFC, the private sector arm of the World Bank Group, has started identification of projects in the private sector. A number of third party projects, including those proposed by the Participants in the PCF, are anticipated in the portfolio and some projects are being reviewed. The current pipeline of the PCF consists over 25 projects. Of these, the following five have been endorsed as CDM or JI projects by host governments, and project preparation is either complete or at advance stage:

- Latvia: Liepaja Region Solid Waste Management Project
- Costa Rica: Facility for Renewable Energy Resources

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<sup>4</sup> Views expressed in this document are those of the PCF Fund Management Unit staff and do not necessarily represent the views of the PCF Participants, or the World Bank.

<sup>5</sup> Participating governments are Canada, Finland, the Netherlands, Norway, Sweden, and the Japan Bank for International Cooperation (JBIC). Companies include BP Amoco, Chubu Electric Power Company, Chugoku Electric Power Company, Deutsche Bank, Electrabel, Gaz de France, Kyushu Electric Power Company, Mitsubishi Corporation, Mitsui & Co., Norsk Hydro, RWE, Shikoku Electric Power Company, Statoil, Tohoku Electric Power Company, and Tokyo Electric Power Company. In addition, Fortum and Rabobank have communicated their commitment to join the second closing of the PCF, scheduled for the end of September, 2000, taking private sector Participants to 17 and the total PCF capitalization to \$145 million.

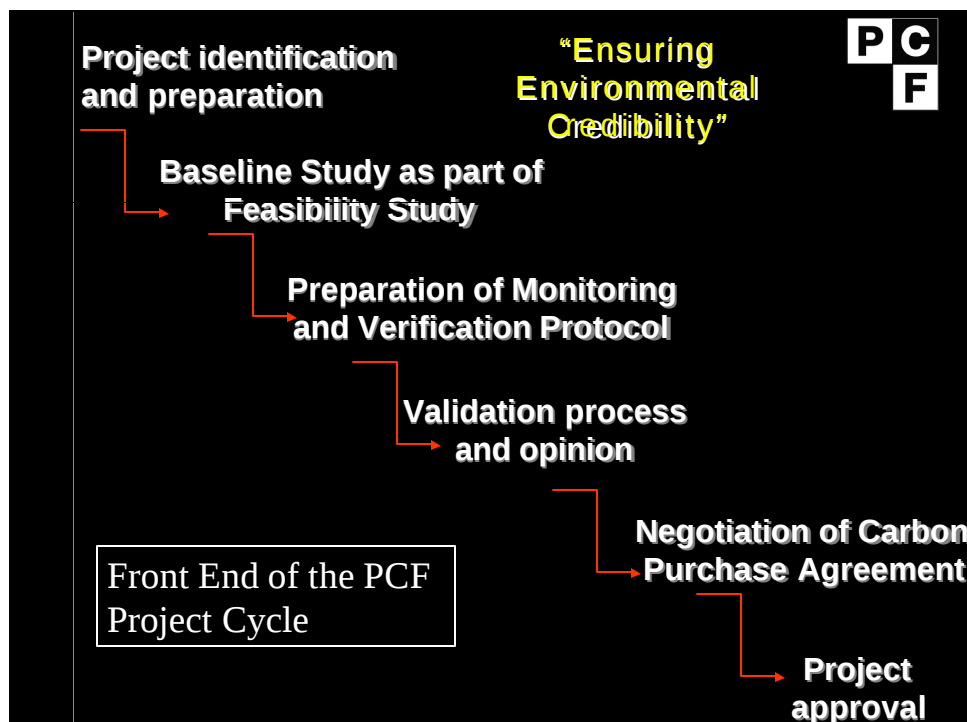
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- Czech Republic: Energy Efficiency projects
- Uganda: Small Hydro Power in West Nile Region
- Guyana: Bagasse-based Cogeneration at Skeldon.

This note discusses issues related to the project cycle of CDM-like projects first, and then presents wider policy, as well as CDM and JI framework-related lessons that have emerged from the implementation of the PCF to-date.

## **Project cycle issues**

The PCF project cycle is identical in name and sequence to the steps documented in the Consolidated Text on Principles, Modalities, Rules and Guidelines for CDM (FCCC/SB/2000/4). PCF's experience to date is largely at the front end of the project cycle, beginning with establishing the baseline, preparing the Monitoring and Verification Protocol, leading to the baseline validation process and laying the foundation for negotiation of emissions reductions purchase agreements. Conservatively, until guidance is received from COP-6, PCF applies CDM-like procedures to both CDM and JI projects. PCF is working through these steps in about ten projects right now and has considered over 20 deals in all. The front-end of PCF project cycle is provided below.



### ***Cost of CDM-like procedures***

The PCF operations to-date allow a more accurate estimation of the cost of CDM-like procedures being negotiated for at least a part of the project cycle. The estimation of costs for procedures up to the Validation of the project is based on actual work done for the Latvia project, and on host

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country-endorsed project preparation activities in advanced stages in the Costa Rica, Czech Republic, Guyana, Uganda, as well as 6 other projects under preparation elsewhere.

PCF experience to-date with the above projects suggests that the *total costs for CDM-like procedures* will be in the range of US\$ 200,000-400,000. This total does not include any CDM or JI fees that may be levied by the Executive Board or the Parties.

The total costs included the costs for the following procedures:

- **Baseline study:** Effort and costs of defining the baseline and establish environmental additionality depends on the type and complexity of the project and on the stage of project preparation at the time the baseline analysis is undertaken. If the project preparation is advanced and, for instance, a feasibility study has been completed, the additional cost for undertaking the baseline study can be substantial. If the baseline study to determine environmental additionality is undertaken in coordination or as a part of the feasibility study, the additional cost can be modest for moderate-sized project. Based on PCF operations, it is estimated that the level of effort would be 3-4 person-weeks for experts with an understanding of the methodology. The estimated cost of preparing a baseline study and presenting a case for environmental additionality is estimated to be about US\$ 20,000 for projects without significant level of complexity.
- **Monitoring and Verification Protocol or Plan (MVP):** The MVP for a project has to be based on the baseline study and case presented for establishing the environmental additionality. It has to be specific in identifying all the data collection and measurement requirements and assigning responsibility for these tasks. The baseline study and the MVP are the critical documents for the Validator to undertake the Validation exercise. The MVP can be standardized to a significant degree for a technology for a particular end-use. With such standardization will come significant cost reductions. For the first of its kind MVP, the level of expertise is about 4-5 person-weeks and the estimated cost is about US\$ 40,000. It must be emphasized that for subsequent MVPs, the cost are likely to be substantially less.
- **Validation** is a process of assessing whether a project, as elaborated in the project design documents, meets the specified criteria. As indicated, the clearer the criteria, the simpler and cheaper is the validation process. In the PCF validation effort to date a significant part of the effort has been in anticipating and identifying requirements and criteria that are likely to ensure environmental additionality and credibility and which, at the same time, the Parties are likely to agree upon. In the Latvia project, the PCF spent about US\$ 40,000 and about four weeks of effort was required. Based on the experience and recognizing the potential for significant cost reductions, the PCF has identified the need for a validation protocol to streamline and standardize this procedure. As indicated, such a protocol will require the criteria for CDM and possibly JI projects that the Parties have agreed on along with any host country criteria. The PCF estimates that standardization of the validation process will result in cost of about US\$ 20,000 when using state-of-the-art certification agencies.
- **The total front-end costs** for CDM-like procedure including the legal fees for the Emissions Reductions Purchase Agreement is likely to be in the range of US\$ 100,000 to 200,000. The costs would fall towards the lower end if the project does not involve first-of-a-kind applications and if the baseline study, MVP, validation process and the ER purchase agreement can draw on previous experience and documents. In addition, to these front-end procedures, projects would require to be registered after validation.

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- The PCF requires an **initial verification** prior to commissioning to ensure that the project has been constructed according to design, the monitoring system is in place as required by the MVP and the case for environmental additionality presented in the baseline study reflects the reality. After commissioning, **periodic verification** of emissions reductions will be needed. This can be followed by **certification** of the emissions reductions by the verifier acting as the Operational Entity entrusted with these functions. It is estimated that verification and certification and general project supervision will require US\$ 100,000-200,000 in the typical 20-25 year life of the project.

### Impact of transaction costs on small projects

*Key Finding: For projects less than US\$ 2 million in emissions reductions financing, and about US\$ 8-10 million in total financing, the transaction costs to apply the proposed CDM project cycle adds significantly to the cost of emissions reductions making them less attractive than large scale projects with high emissions reductions volumes. For most developing countries the majority of their opportunities to participate in the CDM is through projects with a carbon finance component worth less than US\$ 2 million.*

The initial set of proposals for PCF financing are dominated by small-scale renewable energy projects involving technologies such as PV, small and micro-hydro and biomass, which:

- have higher unit costs due to small size;
- displace low carbon intensity end-uses; and
- typically operate in risky (rural) environments.

For such projects to be viable and implemented, it will be essential to:

- aggregate a number of small projects to reduce transaction costs; and/or
- streamline and simplify procedures for determining baselines, developing monitoring and verification protocols (or plans, MVP), and obtaining project validation.

If the cost of CDM-like procedures is to be kept reasonable in proportion to the total project cost, the desirable size of emissions reductions purchased from the project must exceed US\$ 23 million. This, in turn, implies that total project size would be in the range of US\$ 10-15 million. The implications of this observation on the nature of the CDM and, potentially, JI projects is severe:

- Most non-grid connected renewable energy projects would not reach the threshold level of investment. These small projects will not be able to bear the burden of transaction cost and the cost of acquiring knowledge of CDM procedures would be prohibitive.
- Many of the poorer developing countries would get excluded as the size of the investments and facilities would not match their needs. The risks associated with the investments are also higher in such countries. Often much greater proportion of the investment cost for clean technologies need to be made up-front while the returns flow over longer periods increasing the risk and costs of investment even further.

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### ***Working with Established Intermediaries***

*Key Finding: Using private sector intermediaries to bundle small projects to aggregate emissions reductions and lower transaction costs is an effective means of enabling small projects and small economies to participate in the global emissions reductions market. The modalities for CDM and JI should facilitate this intermediation function.*

Using established intermediaries for aggregating smaller projects offers access to the market in addition to reductions in transaction costs.<sup>6</sup> Established intermediaries that can aggregate projects can include:

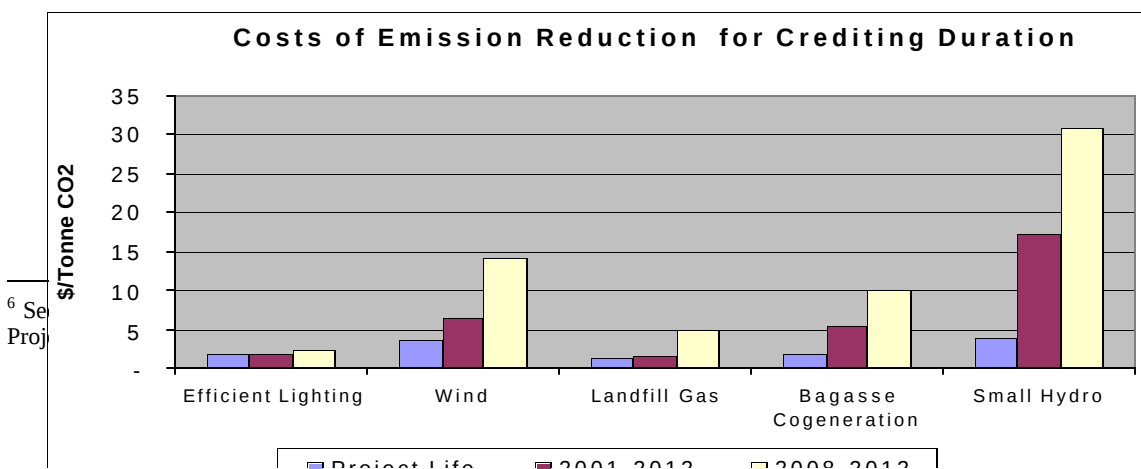
- energy service companies (ESCOs) and private sector project developers;
- local banks or funds with specialized credit lines or involved in "green" or socially responsible investments; and
- energy utilities.

It is important that the modalities to be developed for CDM and JI permit the participation of such intermediaries.

While the role of project and deal aggregators and intermediaries would be critical in both CDM and JI circumstances, PCF operations to-date indicate that relatively fewer intermediaries and deal aggregators exist in poorer countries. International intermediaries and deal aggregators are likely to have higher expectations of return on investment, which increases costs of smaller technologies further.

### ***Impact of Crediting Period on Cost of ERs***

The crediting period influences the cost of emissions reductions from different technologies. Shorter crediting period will have greater cost implications for technologies with longer project life such as small hydro facilities. Cost of emissions reductions from technologies, or projects, with shorter project life (such as energy efficient lighting) will be less sensitive to the crediting period. The effect on cost of ERs will also be less pronounced for technologies or projects which may have a long project life but where the production of ER is not linear. For instance, methane generation in landfills is faster in the first 10 years than the last 20 years in the 30 or 40-year life of a landfill. As a result, the cost of emissions reduction from landfills is not as sensitive to the length of the crediting period as it is in the case of, say, a wind farm where the emissions reductions is uniform in time. The effect of different crediting period is shown the chart below.



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### ***Implications of Diversity in Projects and Policy Environments***

*Key Finding: CDM projects are diverse and must be credible in many different policy environments. To enable an early start of the CDM and avoid overly complicated generic guidance concerning baseline determination and monitoring, the CDM reference manual should evolve with experience and on the basis of precedent*

With the distinctive experience of undertaking some of the steps envisaged in the project cycle of a CDM-like project,<sup>7</sup> the PCF operations to date suggests that:

- CDM projects are very diverse and must be credible in many different policy environments;
- the ways in which many possible CDM projects are unique and may have specific requirements is very difficult to anticipate; and
- providing comprehensive methodological guidelines valid for a wide range of project types and national circumstances is likely to entail a high degree of complexity. Moreover, the development of such guidelines will probably delay the start of the CDM. These early guidelines may also need substantial revisions to accommodate actual project experience.

As a consequence of the PCF experience, it is suggested that the planned CDM Reference Manual implement a discovery process: The manual should evolve over time with experience of CDM implementation for a growing number of common technologies and applications. The manual should be based on precedence and sound methodologies on, for instance, how to determine baselines and prepare an MVP in different project cases.

## **Baseline Methods and Related Issues**

### ***Choice of methodology and its implications***

*Key Finding: Streamlined and simplified procedures for establishing and validating baselines and monitoring and verification plans (MVP) and for performing verification and certification for small projects, such as rural renewable energy supply, are critical to enable them to benefit from CDM investment. Establishing multi-project baselines and MVPs as well as simplified procedures for validation and verification is one such option. Sectoral baselines for integrated power grids greatly facilitates and promotes local investment in small scale and renewable power generation capacity.*

The PCF's approach to baseline methodology is "Project-by-project methods first" for the reasons elaborated in the PCF Implementation Note on Baseline Methodologies. For a number of small renewable energy project proposals submitted to the PCF for consideration, project-specific baseline methodologies would be prohibitively expensive. Streamlined procedures for baseline determination, validation, monitoring and verification are required for these projects to be implemented. The majority of developing countries will rely on small projects (such as renewable

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<sup>7</sup> PCF implementation to-date has taken project preparation to the stage equivalent of Validation. As a consequence, in the following sections particular attention is given to procedures leading to the Validation of a CDM-like project.

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energy) for the benefits of the flexibility mechanisms.<sup>8</sup> Without simplified baseline methods and streamlined procedures the distribution of benefits across countries from CDM and JI projects will be extremely limited.

Streamlined or simplified procedures must, to begin with, find lower cost procedures for determining baselines while managing to retain environmental credibility. Experience of the PCF suggests that the development of standard-oriented baselines would reduce the transaction costs for all market participants, promote JI and CDM activities and are imperative for small projects to be viable under the mechanisms.

While standard-oriented baselines (such as performance benchmarks, reference technologies, sectoral baselines, etc.) are expected to generate substantial cost savings in project preparation, the following must be appreciated based on PCF's operation and consultation process regarding a broader, standard-oriented approach for setting baselines:

- Even though standard-oriented baselines (at the sector level, for instance) decrease costs for individual projects, they imply higher initial costs for developing the standards and may also need political approval. Furthermore, these costs are incurred before any investment decision is made. Finding the resources for standard-oriented baselines can be a significant barrier.
- Standard baselines may have implications for the validation, monitoring and verification processes. For instance, a sector baseline will need to be validated at the sector level in addition to the validation of any individual project in the sector. But this two-step validation process will decrease the complexity of validation and thus the cost at the project level.
- Standard-oriented baselines are politically contentious, because they can have consequences for the distribution of benefits from JI and CDM activities, and because baseline standards may be seen as implying a move towards emission limitation commitments for non-Annex I countries.

As a starting point, the PCF believes that replicable or multi-project baselines would facilitate the promotion of small renewable technologies. For instance, low-efficiency diesel can be assumed to be in the baseline for photo-voltaic (PV) applications in remote rural areas. If there is agreement on this baseline, then there is no need for the validation of the baseline for any project involving a number of PV systems in a remote region. The emissions reductions can be based on performance benchmarks for the diesel and PV systems. And verification can be limited to a sample audit of installed PV plants on a periodic basis. The periodicity can be reduced or increased on the basis of sample audit results over time.

### ***Policy baselines and perverse incentives***

*Key Finding: Progressive countries could be penalized by being ineligible for emissions reductions financing when they have pre-existing policies that favor development of climate-friendly technology, such as renewable energy sources, where these are not the least cost supply option. Other countries could benefit from maintaining or introducing carbon intensive policies. Current approaches to assessing "additionality" may have these perverse outcomes and deserve*

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<sup>8</sup> More than half of the developing countries have power systems of less than 500MW of installed capacity and grow at less than 5% per annum. Even in ideal circumstances, this implies only one large power supply project every couple of years could benefit from CDM investment.

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*careful thought by UNFCCC Parties in developing guidance on baselines and acceptable policies (policy baselines).*

- PCF experience suggests that baselines are often driven by one or two decisive factors and that these factors are in many cases policy related.
- The impact on GHG emissions of national laws and policies that reflect a country's priorities and preferences without prior consideration of the possible benefits from the CDM or JI transaction can be substantial. Such policies are inherently difficult to distinguish from those that might be adopted with the purpose of maximizing profit from CDM and JI.
- Pre-existing domestic policies can have two effects: (a) governments/countries would be rewarded for distorting policies that result in more carbon intensive baselines than would be the case without CDM or JI; (b) governments/countries would be penalized for proactive environmental policies that result in baselines with lower emissions than those of their peers.
- It appears that the incentive to governments to take advantage of the CDM increases the risk of this policy problem to be aggravated over time. This suggests that Parties may have to provide guidance on "acceptable" policies (policy baselines) that would be applied for assessing additionality.

Consider the following cases:

- Latvia: The waste management baseline is affected by the Latvian desire to become an EU member as quickly as possible, which in turn requires environmental standards that are higher than currently affordable and implementable. The timeline of the baseline is the critical issue.
- In another country, the government intends to diversify its fuel base to reduce supply risks and is therefore willing to invest in much more expensive renewable energy, which would thus become the baseline source, such that renewable energy projects in the country become ineligible for the CDM. The distinction between motives is the critical issue.
- Yet, other countries have enacted legislation that make it illegal to flare gas or require a certain percentage of renewable energy – without, however, being able to afford or enforcing these laws.

These cases appear to be widespread and are particularly difficult to deal with in projects with public sector involvement, where policies may not be explicit. PCF operations have not yet observed any case in which a government has deliberately lowered environmental standards (raised baseline emissions) in anticipation of the CDM. But there is no doubt about the incentives for such behavior, and it is already apparent that the CDM would reward governments/countries for past low energy efficiency and environmental standards.

The PCF experience suggests that it will be appropriate for UNFCCC Parties to formulate policies that address these outcomes. While it may be difficult to reach an agreement on the maximum level of subsidies for carbon intensive fossil fuels that would be allowed in determining the baseline and computing eligible emissions reductions credits, in the least there should be no penalty for countries that have proactively deployed or planned to support climate friendly technology. Specifically, if a renewable energy development is not the least cost solution domestically, it should be eligible under CDM and JI.

It would be helpful to have clarity on these issues at the time the CDM starts to operate. The need for early clarity stems from the fact that countries that are proactive in deploying or planning to

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deploy renewable energy technologies are the most supportive in the promotion of CDM investments.

### ***Role of investment analysis in determining environmental additionality***

*Key Finding: PCF's experience suggest that environmental additionality should be the key determinant for credible projects and that project credibility must be demonstrated by developing a credible baseline. Investment analysis and the use of control groups are important, but not the only methods for determination of a credible baseline. Standardization of baselines, such as agreed benchmarks, can greatly facilitate project preparation and reduce costs and uncertainties.*

For the PCF, environment additionality is the essential criterion for ensuring environmental credibility for both CDM and JI projects. The PCF establishes environmental additionality by determining a project baseline and baseline emissions with which actual project emissions are being compared. A variety of methods for establishing baselines, both project-by-project and standard methods, can be used and are being discussed by the Parties.

At this time, the PCF relies predominantly on project-by-project baselines while exploring alternatives. The two main baselining methods available to the PCF and applied as appropriate given the specific characteristics of a proposed project are the investment analysis and control groups. PCF experience suggests that both approaches can be used and that elements of both are likely to be mixed in the process of determining and monitoring the baseline. In the case of the PCF, investment analysis to establish the baseline is likely to be used in most projects.

In this context and responding to feedback received in extensive consultations with PCF stakeholders, it appears important to emphasize that:

- from the PCF experience to date, the PCF views investment and financial analysis as one set of tools among others, that can be used to determine project baselines and establish environmental additionality. Investment and financial analysis should be permitted as a possible method for establishing project baselines.
- PCF is required to apply investment and financial analysis for all projects that it will invest in, irrespective of the method used to establish the baseline and environmental additionality. This is essential for determining the viability of the projects and for estimating the costs of emissions reductions from these projects. The PCF recommends financial analysis of CDM and JI projects as a good practice. Moreover, it seems unrealistic that any private sector investment would occur without such analysis. It should also be noted that for many public sector projects some kind of benefit-cost analysis can be expected, which is standard practice for an investment operation.

### ***Development finance and additionality***

*Key finding: So long as concessional development financing does not earn emissions reductions it can be a valuable adjunct to emissions reductions financing in supporting climate friendly and high development impact technologies that would not otherwise be competitive sources of emissions reductions, such as Solar Photovoltaic power. However, in most cases, emissions reductions financing will displace and free up development financing for use in other socially*

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*desirable development projects. This result is desirable as development financing should not crowd out private investment, including investment for the production of emissions reductions.*

It is common for potential CDM or JI projects to have substantial local environmental or social benefits. These social and environmental benefits often make such projects eligible for concessional development financing.

- In many projects it is difficult to decide whether concessional development finance would be available to fill the financing gap in the absence of CDM or JI resources. However, co-financing of CDM and/or JI is justified for some climate friendly technologies, such as photovoltaics, where carbon financing alone is not sufficient to make them viable as CDM projects.
- Assuming that the volume of development assistance is maintained, a robust environmental additionality test will ensure that CDM and JI resources are directed to cost-effective climate friendly options while development assistance and concessional development finance is re-directed to socially relevant sectors in developing countries.

#### ***Non-domestic ERs***

*Key Findings: Being unable to capture the benefits of emissions reductions achieved in countries other than the one in which the JI project is located, such as by displacing imported fossil fuel generated power, reduces the incentive to invest under Joint Implementation and may raise political concerns under CDM. This disincentive deserves the Parties' attention.*

When renewable energy or less GHG intensive technologies are added to a grid that is interconnected with other countries in the region (for instance the Central American grid or the Southern African Power Pool or the Baltic Ring), emissions reductions may take place in countries other than the location of the CDM or JI project. There is a need for a clarification on how emissions reductions projects in such grids would generate credits.

- The need for such clarification is stronger in the case of JI projects as the emissions reductions have to be adjusted against the assigned amount of either the country with the project, or the country in which the emissions reduction occur.
- The benefits of investment for emissions reductions through CDM or JI may lead to adverse economic impacts in the neighboring country without any compensating economic benefit. For instance, revenue from sale of coal thermal power and employment in the coal mining sector in a country may be affected by introduction of a large gas or hydro capacity in a power pool involving neighboring countries.

#### ***Validation***

*Key Finding: The costs of validation can be lowered significantly if a simple validation protocol is developed requiring only the information that bears directly on the environmental credibility of the baseline and the monitoring and verification plan.*

The PCF has completed the validation of the Latvia Liepaja Region Solid Waste Management project. Building on this experience, the PCF has commissioned the drafting of a preliminary PCF Validation Manual. The Latvia experience clarified a number of issues and facilitated an

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understanding of the process and the procedures that need to be followed for a credible validation. These are:

- *Outcomes and expectations from the validation step in the project cycle need to be clearly defined and understood.* Validation is a process of assessing whether a project, as elaborated in the project design documents, meets the specified criteria. The validator can only assess conformity of the project for well-defined criteria – the clearer these criteria are, the simpler and cheaper the validation process can be.
- *Need for host country criteria:* While the Parties need to agree on a clear set criteria for CDM and, if appropriate, JI, the host country Parties should identify and clearly articulate their own additional criteria for CDM or JI projects according to national circumstances. The validation process can then take these into account.
- *Need for a validation protocol:* The internationally agreed criteria for CDM and, if appropriate, JI along with any host country requirements need to be assembled in a validation protocol. This will permit standardization of the validation process and will result in much lower cost of the process. Work on a preliminary validation protocol and validation manual has been commissioned by the PCF and is expected to be available by COP-6.

## **Framework-related Issues**

### ***Private sector as Operational Entities***

*Key Finding: Emissions reductions are invariably the minor product and revenue source in energy, industry and transport infrastructure investments. Hence an efficient time-bound decision cycle which quickly establishes the eligibility and level of possible carbon financing and thus does not get in the way of unrelated, dominant decision factors is critical to ensure private investment will flow to CDM and JI projects as opposed to business-as-usual more carbon-intensive activities.*

Experience in identifying CDM and JI projects in the private sector suggests that the project cycle in the private sector is short and investment decisions are made faster. Hence, there is a smaller window of opportunity here than in the public sector to influence the decisions to upgrade to more climate friendly options utilizing CDM or JI resources. This puts a premium on making the decision cycle efficient and time-bound. Risk of delays in approval of CDM and JI add to the typically higher risk associated with the climate-friendly option, and can also add to the likelihood that private sector investment will be attracted to the carbon-intensive project. The design of CDM procedures and the choice of means to undertake these procedures must be guided by the objective of engaging private sector to invest in CDM and JI.

PCF experience suggests that there is substantial private sector capacity in Annex I and several (but not all) non-Annex I countries to deliver on then CDM procedures that are being negotiated. In countries where the certification industry is well established, it has been demonstrated that this industry can develop and regulate standards to guarantee environmental credibility in an efficient and cost-effective manner.

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The challenge to the Parties is to regulate the market efficiently. PCF is convinced that the private sector can play an important role as Operational Entities. Efficient markets with private sector capital and private sector Operational Entities could be promoted if the Parties:

- keep the project cycle short and predictable;
- avoid or minimize ex ante, open-ended approval processes at the pre-investment stage and instead rely on ex post audits with heavy penalties for negligence or malpractice to ensure environmental credibility; and
- create transparency and predictability through the CDM Reference Manual which can contain, for instance, agreed validation protocols, accreditation criteria for operational entities.

### ***Accreditation of Operational Entities***

*Key Findings: There is sufficient depth in the private sector globally to play the role of Operational Entities for validation, verification and certification and many precedents exist in market regulation for efficiently establishing and maintaining high practice standards. To take advantage of this capacity, the Parties would need to provide clear guidance on standards, and insist on professional accountability and liability for negligence in the event of non-compliance.*

In order to design the business processes underpinning its project cycle, the PCF has engaged in consultation with the private sector auditing and certification industry for three years. From these consultations have arisen a body of practice for baseline assessment, monitoring and verification, and validation, and pre-requisites for professional standards. Apart from demonstrated ability to undertake the offered services, the PCF requires validation and verification entities to:

- be accredited by some publicly recognized environmental accreditation scheme (e.g. ISO 14000);
- have international operations and track record as well as a recognized reputation; and
- be accountable and capable of bearing liability for professional negligence in the application of CDM and JI procedures.

The PCF takes particular care to avoid conflicts of interest by selecting truly independent firms. These criteria are fairly restrictive at the current state of the market, in many cases limiting the eligible companies to the big international auditing and certification firms.

### ***Role of developing country Operational Entities in cost reduction:***

Difference in wages and salary cost between OECD and non-OECD countries does permit potential cost reduction in application of CDM and JI procedures. Significant cost reductions are likely to occur when domestic entities are used in CDM and JI host countries. The following, however, need to be highlighted:

Ensuring environmental credibility would require that domestic accreditation standards in CDM and JI countries are uniformly applied in all countries. This is not necessarily the case.

The capability and expertise required to carry out the procedures to conform to international standards do not exist in all non-OECD countries. The capacity is even more thinly distributed in the poorer economies hence the cost providing certification services are likely to be higher in these countries than in countries with high technical skills.

### ***Host country capacity and institutional requirements***

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*Key Finding: Capacity building for emissions reductions market development has two critical components. One is building confidence with buyers of emissions reductions that governments understand the Protocol's requirements and are willing and capable of meeting these requirements in facilitating CDM/JI transactions. The other is building the capacity of the local private sector to identify and intermediate carbon financing and assist with project preparation and supervision. Neither of the two is sufficient without the other to ensure countries can benefit from CDM/JI transactions. And both are critical to reduce risks and transaction costs and facilitate project replication.*

Outreach in the course of PCF design and implementation re-enforced the need for capacity and institution building in CDM and JI countries. Based on experience to date of the PCF, which simply re-confirms the wider experience of the World Bank Group, we believe that the lack of human capacity will be the single most important factor limiting the volume of transaction for CDM and, possibly, JI.

In addition to the need to develop human resources, there is an urgent need to support the development of institutions and institutional arrangements for reviewing, approving and negotiating CDM and JI projects. CDM and JI countries will need to understand the complexity of the emerging carbon market and institutional, regulatory and legislative changes that will be necessary to benefit from this market. For instance, most CDM and JI countries would need to legislate the authority to negotiate and sell emissions reductions (which may be viewed as national assets in many regulatory regimes) downwards to the relevant government entities or, preferably, to the private sector.

*The Emissions Reduction Purchase Agreement with Latvia:* The Liepaja Regional Solid Waste Management project was negotiated between the PCF and the Government of Latvia, with the city of Liepaja participating in the negotiations as a co-signatory on the minutes to the negotiations. A separate side-agreement between the Government of Latvia and the City of Liepaja is required under the Purchase Agreement. The PCF is of the opinion that it can enter into Purchase Agreements directly with the private sector project entity provided that the private sector is legally entitled by the Government to do so. The PCF believes that the participation of the private sector can be encouraged by legislating the authority to enter into emissions reductions purchase agreements to the private sector, with the Government retaining only essential regulatory authority. The PCF and IFC are exploring suitable contractual arrangements between the CDM or JI country government and the private sector, which will facilitate the participation by the project company located in the host country.

***Nature of the CDM deal: purchase of emissions reductions versus project finance***

*Key finding: CDM and JI are unique amongst global environment financing mechanisms in that they foresee vastly larger scale funding and seek to mobilize private investment around a new commodity ("greenhouse gas emissions reductions"). Facilitation of thousands of private sector transactions requires ex post market-based regulation of a type found in commodity markets rather than ex ante project by project review. A heavy-handed review process at the project finance and investment stage is not helpful, if the volume of investment required to mitigate climate change is to occur.*

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Early in its implementation, the PCF Team realized that CDM and JI transaction involved the purchase of emissions reductions as opposed to conventional project finance with investments in specific project component or activities. The Instrument establishing the PCF was amended to reflect this function of purchasing emissions reductions. This function has implications on the way risk is shared in a project, as well as on the way project liabilities are handled, and may have an important impact on the financial engineering of a specific project.

In certain cases, the PCF may make advance payments against future delivery of purchased emissions reductions. In such cases, the PCF resembles that of a project financier. Advance payments in a contract to purchase emissions reductions may be required in the absence of the credit market in a CDM or JI country having confidence in the revenue stream from sales of emissions reductions. In time, it is expected that the credit market will gain sophistication, and debt financing against emissions reductions purchase agreements will replace advance payments.

### ***Fungibility of Emissions Reductions and Investment Flow***

*Key Finding: Lack of fungibility will profoundly change the incentive to invest in CDM/JI emissions reductions. Investors will be unable to place certified emissions reductions in the highest value Annex I country regime year by year and reallocate them as needed. In addition, the advantages many investors seek by pooling their capital in funds to spread risk and lower transaction costs will be largely eliminated as investors will be unable to allocate and reallocate their share of a projects' emissions reductions to the Assigned Amounts of their preferred Annex I country.*

It is important to track and register the source of emissions reductions from CDM and JI projects to ensure environmental integrity. However, being required at the time of project registration to irrevocably specify the Annex I country against whose obligations these emissions reductions would count would greatly limit the incentive to invest in CDM and JI countries. In the negotiations this is referred to as an issue of "fungibility" i.e. whether or not emissions reductions earned can be readily directed, or redirected, at any time to meet any Annex I country's obligations.

Requiring the destination of emissions reductions credits to be registered up front and irrevocably, limits incentives to invest in CDM/JI projects and hence reduces the technology transfer and development benefits of the trade for the following reasons:

- The advantage of fund mechanisms like the PCF, namely to pool capital for the purchase of emissions reductions and to reduce risk and transaction costs when investing in CDM or JI countries, would be greatly reduced as most shareholders would be unable to direct or redirect their share of emissions reductions in any one project to the country in which they have emissions reductions obligations.
- Similarly, bilateral investors acting as brokers or traders or multinational companies with emissions reductions obligations in several countries would be unable to take advantage of volume, needs, and hence price differentials between Annex I countries' domestic emissions reductions trading regimes.
- There may also be instances where a private sector entity may choose to utilize the credits in a favorable tax regime or in a regulatory environment where it may have emissions reduction obligations, and these incentives would be denied if there was no "fungibility".

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Limiting fungibility has been thought by some as a means of controlling prices, and hence increasing the prices paid, and overall revenues from emissions reductions purchases in CDM and JI countries. However, it could have the reverse effect, in that the volume of trade, and revenues arising from the flexibility mechanisms might be greatly reduced.

Hence, the outcome of negotiations on this single element of the design of flexibility mechanisms has far-reaching implications.

### ***The CDM and Sustainable Development***

*Key Finding: It is possible to obtain a proxy measure for sustainable development contributions of CDM/JI transactions at small additional cost by identifying, quantifying, verifying and certifying a limited number of other social and environmental attributes of emissions reductions activities along with generating certified emissions reductions. This will enable governments and civil society to understand the wider development impacts of CDM/JI activities. It will also enable markets to reward certified emissions reductions which clearly result in local social and environmental benefits.*

Assisting a country in achieving sustainable development is a clear objective of the CDM as stated in Art. 12 Kyoto Protocol.

The issue that arises is whether the CDM's contributions to sustainable development can be measured. It seems quite unlikely that any operational definition of sustainable development would be agreed by the Parties which would enable CDM transactions to be monitored as to their contribution to sustainable development. This is not even under discussion. In practice, each developing country reserves the right to decide what for it constitutes sustainable development and hence to judge CDM outcomes by their own metric. While it is reasonable to suggest that projects which mitigate climate change are by definition contributing to sustainable development, the PCF has found that it is possible at low additional cost to incorporate into the project cycle measures to identify, quantify, verify and certify the existence of other environmental and social benefits coincidental with more climate friendly projects.

Operationally, these incremental measures include:

- Identification of coincidental social and environmental benefits of the selected CDM project at the time of environmental and social review ;
- Incorporating into the baseline study a projection of the social and environmental impacts of the baseline project, and
- Incorporating into the Monitoring and Verification Protocol (MVP) data collection and analysis requirements and methods which would allow these additional social and environmental attributes of the CDM project to be verified and certified along with emissions reductions.

In the PCF's Latvia project, one of several monitored local environmental outcomes is reduction of leachate infiltration into groundwater from open dump sites and a social benefit is maintaining garbage collection fees at an affordable level. These measures are incorporated in the MVP for the Latvia project. Identification of environmental and social impact and benefits is a pre-

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requisite of PCF projects in any case, and is simply good practice in the industry generally. The additional costs of incorporating these measures in the MVP and of verification and certification of the outcomes are hard to estimate, but they are clearly marginal to the effort required to monitor and verify emissions reductions.

Finally, in reviewing these optional procedures with host government representatives and other stakeholders, PCF finds that:

- Most host country administrations welcome the opportunity to obtain independent measures of environmental and social benefits which could serve as a proxy measure for contributions of the CDM to sustainable development, and that
- Some investors and brokers in emissions reductions see a market for emissions reductions that have independently certified additional environmental and social attributes.

If these attributes can be added, albeit voluntarily, at low marginal cost in the CDM project cycle, investors and/or host governments may wish to routinely capture them and use them as a “quality” differentiation for emissions reductions they offer to the market. PCF will now routinely adopt these practices and report on the outcomes.