

The UNEP Project CD4CDM

BUNDLING SMALL-SCALE CDM PROJECTS

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Executive Summary

Rationale for promoting small-scale CDM projects

Some studies and estimates indicate potential of small-scale (SSC) projects under Clean Development Mechanism (CDM) is large, especially in Africa and small countries in other regions. SSC projects are considered to contribute to sustainable development, especially its social dimension, much more effectively compared to large projects. This is on account of higher level of community involvement in such projects. Geographical equity considerations also favour promotion SSC CDM projects on account of their prevalence in Africa and some other regions.

Small-Scale Projects (SSC Projects) find it difficult to benefit from the CDM

The small size of individual projects makes them unattractive to buyers who also perceive them to be more risky investments. High transaction costs and low sales realizations deter project developers from offering Carbon Emission Reductions (CER) in the CDM market, despite the simplification of baseline and monitoring protocols. Project developers find it hard to bear high up-front costs and risk capital for running projects through the CDM market is not available.

The CDM market is still in its infancy and SSC projects need more support

CDM transaction process is yet not fully understood by the project developers and other stakeholders. It is perceived to be complex, time-consuming and uncertain. Standardization of baselines at regional/ local level and development of databases is needed to reduce transaction costs further. As part of the process to reduce costs, development of local competencies and linkages and actions such as fast tracking clearances of SSC projects by Designated National Agencies (DNAs) is also required.

Bundling of several SSC Projects is a practical solution

Bundling of SSC projects for CDM purposes can help pool the risks, and reduce transaction costs besides taking advantage of simplified procedures and favourable environment and support for SSC projects. Some bundles of SSC projects are currently in pipeline and expected to provide experience in bundling. However, attention may need to be paid to address issues relating to building of the bundles - homogeneity, redundancy risk, time scaling, size and ownership. Legal and taxation issues may also be relevant in country specific context. Bundling has potential to make a difference to SSC CDM projects provided issues of capacity building, and development of information and databases are addressed.

Potential bundlers

A number of entities such as project developers, project consultants, ESCOs, supplier of equipments, financiers, and CER buyers can assume the role of a bundler. A bundler needs to have good knowledge of CDM project cycle, experience of project identification and development, risk taking ability, access to finance and other skills related to CDM finance market and project development. Each of the potential

bundling entity mentioned above has its own strength and weaknesses, and may have a role and niche in bundling SSC projects.

A Bundling organisation as a business entity

Bundling may be extension of existing line of business for some organisations as bundling alone as an activity may not be viable in the near term. A bundling entity may simply act as a broker and only package SSC projects or buy CERs and act as a banker. The business model for the bundling entity has to ensure financial capacity for buying future CER from the constituents who have limited ability to bear the upfront costs on their own, and mitigate risks underlying the non-issuance of CER.

Recommendations and suggested plan of action

Customization and standardization of baseline and monitoring methodologies at regional / local level can speed up the CDM process in general and SSC project inclusion in pipeline of the CDM projects in particular. Institutional and capacity development issues are very important in bundling, as they improve information transparency, deepen market linkages and help reduce transaction costs, thereby making bundling an attractive business proposition. Development of databases, customization of procedures to local levels and building adequate base for information exchange and developing external linkages in countries / regions are other important issues. Therefore, in this initial stage of development, there is a lot of scope for technical and funding support from international agencies, development agencies and donors.

A typical plan of action would involve setting-up a technical secretariat to support small-scale projects and bundling until the capacity has been created in developing countries. The activities of the secretariat could include;

- Supporting development of pre-approved baselines/ methodologies in order to reduce uncertainty and transaction costs.
- Pioneering a few bundling demonstration projects.
- Working as a one-stop shop for technical solutions.
- Setting up online web portal to improve access to the market.
- Development of bundling tool kit - procedures, best practices, legal templates, and accreditations.
- Facilitating establishment of prototype bundling organisation.

A Guide to the terms used in the report

Additionality: A CDM project activity is additional if GHG emissions are reduced below those that would have occurred in the absence of the CDM project .

Baseline: The GHG emission that would occur without the contemplated policy intervention or project activity.

Certified Emission Reductions: A unit of GHG emission reductions issued pursuant to the CDM, and measured in metric tons of carbon dioxide equivalent.

Emission Reductions Purchase Agreement: Agreement, which governs the purchase and sale of emission reductions.

Designated Operational Entity (DOE): An independent entity, accredited by the CDM Executive Board and the COP, which validates CDM project activities, and verifies and certifies emission reductions generated by such projects.

Project Design Document A project-specific document which will enable the Designated Operational Entity to determine whether the project (i) has been approved by the parties involved in a project, (ii) would result in reductions of greenhouse gas emissions that are additional, (iii) has an appropriate baseline and monitoring plan.

Validation: The assessment of a project's Project Design Document, which describes its design, including its baseline and monitoring plan, by DOE, before the implementation of the project against the requirements of the CDM.

Verification Report: A report prepared by a DOE pursuant to a Verification, which reports the findings of the Verification process, including the amount of reductions in emission of greenhouse gases that have been found to have been generated.

1. Background

Understanding how the market works

1.1 Introduction

In 1992, the United Nations Framework Convention on Climate Change (UNFCCC) set objectives of stabilizing atmospheric concentrations of Green House Gases at safe levels.

The Kyoto Protocol adopted at the Third Conference of the Parties to the UNFCCC in December 1997 sets legally binding emission targets for a basket of six greenhouse gases (GHG). The Clean Development Mechanism (CDM), a project-based mechanism designed to permit developed countries to finance projects for reducing greenhouse gas emission in developing countries by acquiring Carbon Emission Reduction (CER) credits, and thereby achieve their targets.

1.2 Market Conditions

The global market for GHG CER is estimated at 200 million tons CO₂ (tCO₂e) equivalent since its inception in 1996, of which nearly 70 million tCO₂e was originated in 2002 alone. Volumes are expected to continue to grow¹.

The findings in the report *State and Trends of Carbon Market 2004*² indicate that the carbon market is growing steadily. A total of 64 million tCO₂e has been exchanged through projects from January to May 2004, nearly as much as during the whole year 2003 (78 million), which suggests that the market might double by the end of the year, the vast majority from project-based transactions intended for compliance with the Kyoto Protocol. The *Report* also states that there is a clear sense of momentum in the market, notably in Asia and Latin America; the approval of some methodologies by the CDM Executive Board (EB) reinforces these dynamics. Asia is the largest supplier of emission reductions (51% in 2003-04), followed by Latin America, developed economies, and Eastern Europe. Five countries (India, Brazil, Chile, Indonesia and Romania) represent two thirds of the supply in terms of volume. Prices of project-based emission reductions in early 2004 have remained essentially stable compared with 2003. Since its inception, the total value of project-based transactions has been of at least \$500m. The total value of contracts for the purchase of project-based transactions has been estimated at about \$330m in 2003, and at about \$260m from January to May 2004 (at a Weighted Average Prices per ton ranging from \$3.85 to \$5.52).

A variety of projects from various renewable energy technologies to nitrous oxide removal figure in the pipeline of projects for carbon financing (Table 1).

¹ As per World Bank/ PCF FAQs, <http://carbonfinance.org/pcf/router.cfm?Page=CFFAQ>

² World Bank/ PCF study report, *State and Trends of Carbon Market 2004*, June 2004, <http://carbonfinance.org/docs/CarbonMarketStudy2004.pdf> (PCF, 2004)

Table 1: Technological distribution of active pipeline projects for Carbon Financing³

<i>Type of Project</i>	<i>%</i>
Small Hydro	25.6%
Waste Management	16.9%
Energy Efficiency	8.6%
Geothermal	8.0%
Biomass	7.5%
Wind	8.0%
Coal Methane Bed	4.0%
Biogas	4.1%
Bagasse	4.0%
Photovoltaics	0.2%
N ₂ O removal	5.9%
Others	2.6%

1.3 CDM process

Projects incur additional transaction costs to go through the CDM process - baseline studies, preparation of Project Design Documents, validation, registration, verification, trading in ER and other UNFCCC and Kyoto Protocol requirements – which are a significant percentage of the revenues generated from sale of CER.

1.4 State of CDM in Asia⁴

China and India are ranked high in the list of the countries with high CDM promise. Despite its huge potential, Asia is perceived to be lagging behind in CDM, primarily because of inadequate institutional and human capacity building, weak market linkages and financial barriers. However, India has recently made some progress with several CDM projects in the pipeline at different stages. (Current situation in India is indicated in Box 1).

³ Schreiber, 2004.

⁴ *Market Creation and Capacity Strengthening for the CDM in Asia*, presentation by Ancha Srinivasan, Institute for Global Environmental Strategies, at the Symposium on *Governance of Markets for Sustainability*, October 2003.

Box 1: Indian Case study: Current Situation

India, the world's 6th largest CO₂ emitter (although per capital GHG emissions are among the lowest), signed the UNFCCC in 1992. After the adoption of the Kyoto Protocol, India signed and indicated its support to CDM in August 2002. The Ministry of Environment & Forests (MoEF) has been designated as the nodal agency for climate change issues. India has one of the largest renewable energy programmes in the world, and implementing energy efficiency projects across all sectors and industries; many of the CDM Projects that could qualify from India are likely to be Small-Scale Projects.

There are varying estimates of the potential of CDM projects in India, the total value of emissions reductions being in the range of 150-200 million tons of CO₂ equivalent. Considering that the cost-effectiveness of emissions reductions generated is a key variable, the leading sectors that have the potential for CDM projects include energy efficiency (approximately market share of 45%), renewable energy (35%), methane emissions abatement (15%), and improvements in the thermal energy generation sector (10%). Studies estimate the value of the Indian CDM market at more than a billion dollars annually⁵.

⁵ Proceedings of the *Clean Development Mechanism - The Emerging Opportunity conference*, New Delhi, April 2004 http://www.winrockindia.org/clean_dev_mech.htm

2. Small-Scale CDM Projects

Why should they be bundled to sell their carbon credits?

2.1 Definition of Small-Scale CDM Projects

The Conference of Parties (COP) at its **Seventh Session** produced the Marrakesh Accords⁶ (COP 7, 2001), which defines small-scale CDM projects as follows:

- Renewable energy project activities with a maximum output capacity equivalent of up to 15 megawatts (or an appropriate equivalent)
- Energy efficiency improvement project activities, which reduce energy consumption, on the supply and/or demand side, by up to the equivalent of 15 gigawatt/hours per year
- Other project activities that both reduce anthropogenic emissions by sources and directly emit less than 15 kilotonnes of carbon dioxide equivalent annually

At the **Eighth Session**⁷ of the COP, some ambiguities pointed out by stakeholders and experts were corrected, such as:

- The term “output” was defined to mean installed/rated capacity, as indicated by the manufacturer of the equipment or plant, disregarding the actual load factor of the plant.
- The term “MW” was reworded as “MW(e)” otherwise to apply an appropriate conversion factor.
- An indicative list of eligible project activities/sectors was drawn up.
- Simplified Modalities and Procedures for the small-scale CDM projects (SSC projects) were laid down with a view to reducing transaction costs.

2.2 Why Small-Scale CDM Projects?

2.2.1 Large Potential for Small-Scale CDM Projects

(a) There some estimates that indicate large potential for SSC projects. A market analysis by consulting organisation E+Co indicates that the potential market for SSC projects is approximately 1,000 projects per year, creating emissions reductions of 500 million tCO₂e over a 10-year period⁸. The analysis is for off-grid energy services, covering mainly renewable energies. According to an IEA study (Bosi, 2001), majority of power plants recently built or currently under construction or planned are located in Latin America and in South Asia, with a significant number of these being small-scale; from 8% in China to 39% in Africa. The study also indicates that actual

⁶ COP 7, 2001, <http://unfccc.int/cop7/>

⁷ COP 8, 2002, <http://unfccc.int/cop8/index.html>

⁸ Carbon Finance, 2004, http://www.ecosecurities.com/200about_us/223press_releases/223press_20_April_2004.html

proportion could be higher due to strong likelihood of data on small plants missing in the database used. A study by ESMAP (2004) indicates a market for more than 0.27 million pico-hydro units in Andean Region (covering Bolivia, Peru, Ecuador, Colombia, and Venezuela), with technical market potential almost three times as much. The study also indicates a market for 0.15 million units in Vietnam, 0.12 million in Philippines over 10 years, and 30 thousand units per year in China. Studies in the Southern African Development Community Programme for Financing Energy Use in Small-Scale Enterprises in Zimbabwe indicated a large market and investment potential in this sector (World Bank, 2003a). Other estimates include 60% of the mitigation potential in Tunisia through small-scale projects (Missaoui, 2004), Peru has a significant potential of small-scale projects (World Bank, 2003b), and; Indonesia has huge potential in small-scale renewable energy (Natalina, 2003). A report by The Energy Research Institute highlights potential for SSC projects in India (Box 2).

Box 2: Excerpts from The Energy Research Institute's (TERI) Report on Identification of small-scale industrial sectors for CDM Projects in India⁹

The report reviewed the Indian small-scale sector in terms of its specific features, structure, support institutions, governmental policies and programmes, and performance in the past few years. It analyzed a total of 41 energy intensive small-scale industry sub-sectors in terms of total energy consumption. Based on performance indices as well as sector needs, three specific small-scale sub-sectors - iron foundries, bricks and ceramic - have been identified as having potential for the development of CDM projects. Three small-scale sub-sectors - iron foundries, brick-making units, and ceramic units - were identified as potential sub-sectors for CDM project development in India. The energy efficiency improvement potential in these sub-sectors ranges from 10% to 30%. These sub-sectors represent the case where technological development is not taking place. Despite the efforts to accelerate technological progress within and beyond individual industry clusters, the adoption of energy-efficient and environmentally-sounder technologies faces numerous technical, financial, and institutional constraints. These constraints are essentially related to the limited capacity of the units to identify, research, develop, and absorb appropriate technologies as well as to access credit for their implementation. The overall purpose of the CDM projects in the clusters should, therefore, be to decrease transaction costs to users, and thus increase the financial attractiveness of such technologies for their wider adoption. CDM interventions in these clusters could also involve establishing delivery chains for credit and technology to the small-scale units.

2.2.2 Sustainable Development Dimension

SSC projects are considered to effectively contribute to sustainable development, specially its social dimension on account of nature of such projects, which means benefits to large number of people and equitable distribution. It is due to less capital-intensive nature of such projects compared to big projects, and community participation and development in case of many such projects:

In an analysis of sixteen small-scale renewable energy projects, that have already been implemented, Sutter (2001) argues that a majority of projects contribute to local sustainable development. This is especially true for social parameters of sustainable development. Often, ten times higher employment effects and a much more equal distribution of income were observed compared to the baseline case (of a coal power plant that the renewables substituted). Due to their decentralised and often work intensive nature most of them contribute directly to diminishing of poverty and to a more equal distribution of wealth.

⁹ Identification of small-scale industrial clusters for CDM projects - a baseline study by TERI, <http://www.teriin.org/reports/rep58/rep58.htm>.

In this and similar other cases, it can be seen that the projects that provide quality energy services to communities through small-scale energy systems, involve a large number of actors and consequent distribution of benefit to them.

2.2.3 Geographical Distribution and Equity

Most of the projects in Africa and poor countries are expected to be small-scale. If the COP's guidance and concern about an equitable geographic distribution of projects among non-Annex I countries is to be considered, it will be important to take effective steps to promote SSC projects for the CDM.

An IT Power and KITE study (2002) noted, “Although it is still early days for the CDM, the projects going through the pipeline already provide a warning that if small-scale projects are not initiated through the CDM, the poorer developing countries may be left without any benefits.” It is also supported by the OECD observation (Bosi, 2001) that in case of upcoming power plants, small-scale projects appear to represent a greater proportion of all project activity in Africa and are particularly significant for smaller developing countries. Similar sentiments have been echoed in case of Tunisia, and Cambodia. For example, **in case of Tunisia** (Missaoui, 2004):

- Small projects fit well with characteristics of the Tunisian economy.
- Industry sector is mainly composed of small and medium enterprises.
- Local economic actors have limited investment capacity.
- More than 60% of the mitigation potential in Tunisia can be met with small-scale projects.
- Procedures for implementing CDM small-scale projects are relatively easy; are well within local implementing capacity of local actors.

In case of Cambodia; “Large scale projects face high sovereign risk; have difficulty in accessing finance, and have relatively low transparency in Cambodia (Sum Thy and Bridget McIntosh, 2002).”

Thus, since in several poor countries access to finance is a major issue for big projects, only small-scale may be a viable option.

“Most CDM Projects in India are those with projected CO₂ savings of 5,000 – 10,000 tons per year” – Rajesh Deshpande, Project Consultant

2.3 Problems for Small-Scale CDM Projects

Buyers of CER find large projects attractive since their transaction costs are lower. The current design of the CDM results in high transaction costs to individual small-scale projects, even with the simplified modalities and procedures. This deters small-scale projects from participating in the CDM process and selling the carbon credits generated by their GHG abatement projects. Reducing transaction costs for small-scale projects is critical to improving access to the CDM market. This and other problems faced by small-scale projects are discussed below.

2.3.1 They generate less offsets

SSC projects produce less CER per project, which are too small to make the CDM transaction feasible. There is no consensus as to what is the minimum size of CER to make for a viable CDM transaction. Michaelowa (2002) suggests a minimum size of 20,000 tonnes of CO₂ per year whereas EcoSecurities sets a higher threshold at 50,000 tonnes per year.

2.3.2 Risks are more

A SSC project faces three types of risks; **project specific risks**, which are common across projects, and include normal business risks; **small-scale project risks**, which are common to all small-scale projects, and; **CDM risks**, which are common to the CDM projects. The first type of risks, for example, includes construction, resource, financial, legal, technology, and political risks etc. SSC projects may face additional risks in terms of perception about credibility of small-scale project developers (and hence their ability to deliver CERs), access to finance, access to market, increased implementation uncertainty due to less control over environment in which project operates, and so on. Assuming that the Kyoto Protocol becomes operational, CDM risks still include international political risks related to emerging rules and regulations for the CDM (Uncertainties relating to baselines and methodologies), country specific political risks and internal framework for CDM, and CER market risks including CER prices. Uncertainty and high-risk means investors in a CDM project would demand shorter payback period, complicating the issue for SSC projects.

There is also a contrary view that SSC projects are less risky than large-scale projects because they tend to be less affected by exogenous factors such as political regimes, international fuel prices and the ability of firms to attract finance in the capital markets. Therefore SSC projects offer better potential to deliver benefits (IETA, 2002). But the argument appears to have made in the context of the desirability of making CDM procedures simple for small-scale projects.

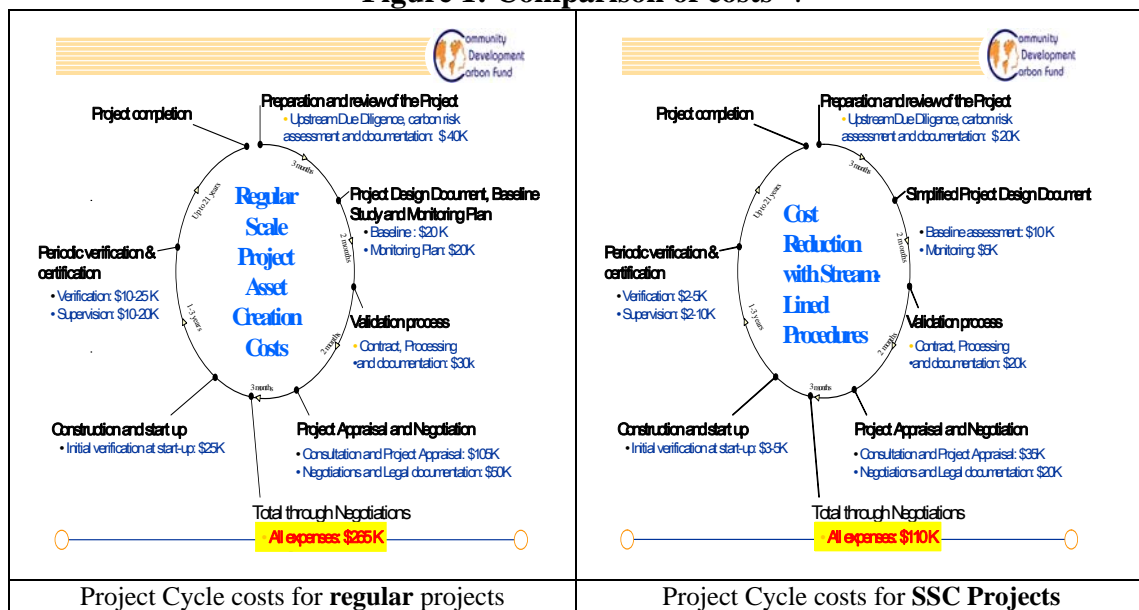
2.3.3 Transaction costs are high

The complex multi-stage process of Project Design Document (PDD) preparation, validation by a Designated Operational Entity (DOE), approval by the CDM EB and the events leading to issuance and sale of the CER imposes high transaction costs regardless of the size of the project. Other CDM costs include cost of monitoring and certification incurred regularly during the project lifetime. Besides these procedural costs, a CDM project incurs costs during the pre-implementation phase also. These costs are incurred searching, negotiating projects and CER selling costs.

SSC projects may not be able to bear the additional transaction costs (Sutter, 2001). The most important difference between small and large projects lies in their ability to absorb transaction costs. The time and costs spent on project development, baseline analysis, preparation of monitoring plan, contract negotiation, achievement of host country's acceptance, validation, registration etc. are in general not dependent on the project size. Thus, the transactions costs are proportionally greater for small projects than for larger ones. Small projects thus cannot absorb the same amount of transaction

costs as large or regular-size projects—in fact, high transaction costs would prevent them from going ahead (Figure 1).

Figure 1: Comparison of costs¹⁰



Risky and costly upfront payments: A series of steps are required for a CDM project—baseline studies, validation, registration with EB, issuance of CER, verification and certification – most of which has to be conducted or directed by the DOE, many of whom use expensive outside country resources. Costs of transacting a CDM project are very high, regardless of the size of the project. The cost burden on SSC projects is prohibitively high, and often could be more than the CER revenues that are generated. Moreover, these costs have to be paid for upfront without any assurances that the project will be approved by the EB. A snapshot of the cost estimates given by various agencies is included in Tables 2 and 3. The practice followed by the PCF, one of the major players in this arena, is highlighted in Box 3.

Table 2: Transaction Costs for CDM Projects – Comparisons¹¹ - US \$:

Name of Study	Up to registration	Post-registration
PWC, 2000	400,000 – 1,000,000	
Walsh, 2000	40,000 – 80,000	10-20% of upfront costs
Eco Securities, 2000	57,000 – 90,000	3,000 – 15,000 per year
PCF	100,000 – 200,000	100,000 – 200,000
Industry Quotes	60,000 – 70,000	20,000

¹⁰ *Small Scale CDM Projects: An Overview*, Report by World Bank, Carbon Finance Unit, May 2003, <http://carbonfinance.org/docs/SmallScaleProcedures.DOC>.

¹¹ IT Power and KITE, 2002.

Table 3: Transaction Costs for CDM Projects – More Comparisons – US \$

	CDM India, 2004 ¹²	TERI, 2003 ¹³
PDD Preparation	6,700 – 22,000	20,000 – 40,000
Validation and Registration	6,700 – 22,000	15,000
Verification	11,000 – 22,000	10,000

“Excluding registration charges, transaction costs are in the range of Rupees 300,000 – 500,000 – and these have to be paid for upfront. There is no way that SSC Projects can do so.” – CDM India, project consultant

Box 3: Practice at the PCF

The World Bank's Carbon Finance Business (CFB) assumes the upfront cost of the preparation of a baseline study, monitoring plan and Project Design Document (which make up the validation package submitted to a Designated Operational Entity for validation). These documents may be prepared either by the project proponent, or an independent consultant; however, in either case, the methodologies to be used need to be discussed with and agreed by the CFB at the beginning of the work. These costs are capitalized in the total Emissions Reduction (ER) purchase in the Emission Reductions Purchase Agreements and deducted from the annual payments for ERs that are made by the CFB to the project Developer. Hence, ultimately, the Developer pays for the costs of project preparation.

Falling costs: However, transaction costs have come down drastically in the last few years as CDM procedures become more clear and transparent, and DOE establish local (in-country) operations that enable them to offer cheaper services¹⁴.

“PDD preparation costs have reduced significantly over the last 2 years; Validation fees have also come down thanks to many DOEs opening offices in India – a local presence makes them price-competitive. However, Project Developers are unwilling to pay high fees to local project consultants contracted by overseas DOEs”
- Yagna Engineers, project consultant, during consultations

Private investor's perspective: In the study of the 16 small-scale renewable projects (Sutter, 2001), Sutter argues that although highly desirable from social and environmental dimension of sustainable development perspective, the majority of the projects analysed will not be able to attract investments from commercial international CDM investors. Even if they show good financial returns (some don't), most of the projects cannot bear the CDM transaction costs. They refer it as a “small-scale CDM” dilemma; projects have high potential to contribute to sustainability, but are unable to attract private CDM investments.

Buyers' perspective: Buyers also incur transaction costs in buying CERs, and would want to minimize their costs - related to information, negotiating and other costs related to purchasing. Since many of these costs are fixed in nature for a transaction, buyers would tend to prefer big projects, as that would reduce their overall costs. This is in the event CER prices stabilize in the CDM market. Alternatively, buyer will offer

¹² Figures indicated by the CDM India during stakeholder consultations.

¹³ Preety Bhandari, *CDM – Emerging opportunities for Indian industrial sector*, TERI, Oct 2003, <http://www.ecosecurities.com/cdmindia/ProjectDocumentation/Preety%20Bhandari-%20Emerging%20Opportunities.pdf>

¹⁴ World Bank's Carbon Finance Business observation: Costs incurred for the preparation of these materials are coming down due to the growth of project experience and the repetition in project types and baselines, monitoring and other project cycle issues.

lower prices for CERs from small-scale projects, except in cases where premium prices are paid to encourage small-scale projects.

2.3.4 CER sale prices are low

CER prices are not very attractive, as from current reckoning, they cannot cover transaction costs except in case of big projects. Further, in the case of SSC projects, the CER sells at prices less than US \$ 3 per ton per year (Kinkead, 2003). Therefore, unless there is a premium on contribution to sustainable development from SSC projects, after setting off the transaction costs, the incremental revenue from sale of CER may not be remunerative and worth the deployment of additional managerial and financial resources.

At current prices of US \$ 3-4 per ton per year, sale of CER is not an attractive proposition, especially since the upfront costs for steering the project through the CDM process has to be borne upfront by the SSC project developer. The CER earnings do not have a significant impact on project Internal Rate of Return (IRR) (Table 4).

Table 4: Impact of Carbon Finance on IRR¹⁵ (\$3/tCO₂e)

<i>Type of Project</i>	<i>%</i>
Hydro	0.8-2.6%
Wind	1-1.3%
Bagasse	0.4-3.6%
EE District Lighting	2%
Biomass	2-7%
Gas Flare reduction	2-4%
MSW	5-10%

Instead, it increases project costs and brings risks of non-conformity with CDM process and non-issuance of CER. Prices of CERs observed in different markets are given in Table 5.

Table 5: CER Rates – Comparisons¹⁶

Pre-compliance trades		\$1–3
Danish market	\$2–2.5	
UK market	\$ 5	
Dutch government	\$ 4.5	
Projections		\$5–\$11

“The current CER price regime does not encourage SSC Projects.”
- IT Power 2003¹⁷

However, considering the sustainable development dimension, issue of premium pricing for CERs from small-scale projects needs to be explored and pursued, and other innovative ways to support small-scale projects designed. Some precedents exist; for

¹⁵ Schreiber, 2004.

¹⁶ Guest, 2003.

¹⁷ IT Power, 2003.

example, German Government bought CERs from community kitchens in India to off-set emissions from the renewable energy conference, held in Bonn in June 2004, at \$10 per ton; “500 PPM” and “Climate Ticket” develop small renewable energy or energy efficiency projects as CDM or JI projects to provide carbon offsets for conferences, travel or product development to make these services as carbon neutral. Thus niche buyer for very small projects can also be found.

“For SSC Projects, given the current CER prices, upfront costs are a very heavy burden” – *Project consultant*

2.4 Actions taken so far to support SSC Projects

In order to reduce transaction costs for small-scale CDM projects, the CDM EB has approved indicative simplified baseline and monitoring methodologies for selected small-scale project activity categories. Project developers have the option of using the simplified baseline and monitoring methodology or propose a new methodology to the EB for consideration and approval. The baseline and monitoring methodologies are standardized so that small-scale projects do not have to go through the procedure of approving afresh baselines or may adopt a less frequent and reduced monitoring plan.

2.4.1 CDM Modalities for Small Scale Project Activities are simplified

Recognising the constraints that SSC projects face, CDM transaction rules have been modified; PDD requirements have been reduced, procedures simplified (**Annexure 2**), particularly in baseline and monitoring methodologies.

Baselines: Simplified baseline and monitoring methodologies for small-scale projects are put-up at the UNFCCC CDM site by the EB, and the list is periodically updated. If a proposed small-scale CDM project activity does not fall into any of the listed categories, new simplified methodologies can be developed and proposed to the EB.

Monitoring methodology and plan: Simplified modalities are specified for each project category, including a less frequent and reduced monitoring plan. No new methodology needs to be developed for approval by the EB

Additionality requirements: Project participants have to show that the project would not have occurred anyway due to an investment barrier, a technological barrier, a barrier due to prevailing practice, or other barriers such as institutional barriers or information requirements

Environmental impacts: Documentation of environmental impacts must be provided only if required by host country

Leakage: Only required biomass, and in case of renewable energy and energy efficiency projects, needs to be calculated only if equipment is transferred from another activity. Leakages need not to be considered for projects involving switching fossil fuels, emission reductions by low-greenhouse gas emitting vehicles, and methane recovery and avoidance.

DOE: The same DOE may undertake validation and verification.

Phased-out bundling: Project activities can be bundled or portfolio bundled at the various stages; PDD preparation, validation, registration, monitoring, verification and certification stages in the project, the only condition being that bundled project should be within the small-scale project limit.

Registration fee: The fee for small-scale projects has been kept low; it is US\$ 5000 for projects generating CERs up to 15,000 tons per year.

Provision for new simplified methodologies and easy access to developed methodologies: Simplified baseline and monitoring methodologies for small-scale projects are put-up at the UNFCCC CDM site by the EB, and the list is periodically updated. If a proposed small-scale CDM project activity does not fall into any of the listed categories, new simplified methodologies can be developed and proposed to the EB.

2.5 What more needs to be done to support SSC Projects

Simplified modalities for SSC projects have been developed by the EB. Further, use of standardized baselines and methodologies will demystify the CDM process further and cut costs at various stages of the project cycle. Approval of more benchmark baselines and methodologies should be an ongoing affair, and local project consultants and project developers should endeavour to customize them for local operating conditions and technical resources.

2.5.1 Standardisation of baselines and development of databases

Customisation of standards to suit country specific conditions: Formulation of baselines/methodologies should recognize local conditions and economic circumstances. Hence, it is important to examine each one of the pre-approved baselines/ methodologies and synchronise them for best-fit to the country-specific conditions, especially in respect of the following parameters:

- Devising techniques that are adapted to the local (country) technical conditions and use existing local technical resources and equipment.
- Using monitoring equipment that are inexpensive to buy and own and are simple to operate.
- Accreditation of local suppliers of equipment and services for validation and monitoring to reduce capital and maintenance costs.
- Limiting monitoring and verification protocols to optimize costs and carbon credit integrity.
- Evolving self-verification processes that may be conducted by the project developer itself without compromising on data integrity.

Development of databases: In respect of certain Indian projects rejected by the Meth Panel of the EB, data incompleteness and inconsistencies have been blamed. The countries may need to develop adequate database to support small-scale projects.

“Data is not available in the public domain to establish a baseline; the time it takes to have a CDM project in place is an entry barrier”
- Stakeholders, IT Power 2003

2.5.2 CDM project cycle perceived to be complex and uncertain

Complex project cycles: Despite the simplification of baseline and methodology issues for SSC projects, the CDM transaction process is perceived to be very complex and not well understood. Many of the CDM procedures are in various stages of evolution, and most stakeholders are simply not aware of or up-to-date on recent developments.

“The guidelines regarding Energy Efficiency (EE) projects are not very clear to us as to which types of EE projects qualify?” – ICICI Bank

Rejection Risk: Uncertainties in the approval process for CDM projects by the EB increases risks significantly. Further, since most CDM transaction costs are payable upfront, project developers may also incur losses resulting from non-approval or delays in approval by the EB.

Common problems of CDM project stakeholders¹⁸: Following problems came to the light during stakeholders consultations:

- No clear understanding of the CDM Process.
- Unresolved doubts about various technical aspects.
- Lack of clarity on technical issues resulting in high cost of preparing PDD.
- Lack of assurances from project consultants, prospective buyers and DOEs that projects conform to CDM requirements.

Some of the barriers identified by the IT power during stakeholder workshops are listed in **Box 4**.

Box 4: Barriers for Project Developers - Complexities of the CDM Process¹⁹

- Lack of clarity at the international level (e.g. ambiguous rulings from the CDM EB)
- Documentation and project baselines are produced on an ad hoc basis
- Not enough standardisation of documents & baseline benchmarks internationally
- Very few approved methodologies for 'large-scale' projects

“Project Developers are not willing to pay fees upfront, and demand assurances from project consultants that they will definitely get approval of the CDM Board. Consultants are not willing to take this kind of risk as they are not conversant with the stages of the CDM process and are not confident of receiving approval.” *Energetic Consulting, Project Consultant*

¹⁸ Based on consultations carried out in India in April, 2004.

¹⁹ Kinkead, 2003. EcoSecurities.

2.5.3 Developing local competencies and linkages

Local competencies and linkages for facilitating the CDM process are limited. It was observed that stakeholders are not well informed on the CDM process. They perceive high risk in the EB approval process. On the other hand, in absence of availability of adequate local expertise fees charged by DOEs continue to be unaffordable by SSC projects. Thus, despite availability of technical abilities, local entities have limited role.

CER sellers also have no knowledge of the pricing possibilities for CERs; they neither have the networking to trade in CER directly in the overseas markets nor do they have adequate information and strategic inputs to understand and tackle price dynamics. Project developers are not confident about local consultants capabilities to take the project through CDM process. Local skills on all these fronts need to be developed.

“Project developers expressed that there is lack of clarity on how to undertake CDM projects” - *Stakeholders, Workshop conducted by IT Power, 2003*

2.5.4 Fast-tracking clearances by Designated National Authority

Some country level actions, that would simplify procedures for approval by Designated National Authority (DNA) for SSC projects may also be helpful. For example, in case of India, the Ministry of Environment & Forests (MoEF), the Designated National Authority, has put in place the criteria, procedures and platform for clearing CDM projects. But they do not have any special procedures for SSC projects; guidance from the MoEF on bundling of SSC projects and a fast-tracked clearance for those that meet with stipulated criteria could help reduce the uncertainties, time and cost required to put the SSC project through the CDM process.

3. Bundling

Analysis of Key Issues

3.1 Bundling of Small-Scale Projects could be the solution

Bundling offers the possibility of addressing some of the issues- especially transaction cost issue- faced by small-scale projects and help realise their CDM potential. In the CDM context, bundling broadly refers to aggregating two or more projects and treat them as one to take them through one or more CDM procedure with a view to reduce transaction costs. Bundling has been recognised by the EB as a permissible option for small-scale projects. The CERs from the bundle can be aggregated for sale purposes, making it an attractive option for the prospective CER buyers, besides reducing transaction costs. The overall transaction costs and other more or less fixed costs of the project can be minimized by bundling similar projects together (Sutter, 2001). Bundling has the following features:

Use of Benchmark Baselines: Since a bundle consists of small-scale projects, the baseline relies normally on a benchmark. This requires homogeneity of the measures taken or the technology being replaced or upgraded. A uniform baseline also reduces transaction costs.

Pooling of risk: The lack of direct control over the investment decision by the individual SSC project developer presents a high risk. However, for the bundler and eventual buyer of the CER, the risks in SSC projects are spread across several projects, lessening it significantly. Changes in CER arising from one project may affect marginally the emission reductions of the bundle.

Long Time Span: Since investment decisions and implementation of individual SSC projects can vary or delayed, CER is issued over a longer time frame compared to a conventional project

Reduced transaction costs: Financial analysis shows that overall transaction costs are estimated to be double compared to those of a full-scale project (Grutter and Burki, 2001). The doubling of cost is on account of costs such as marketing and management of the project and removing barriers to investment, in addition to cost incurred by the bundler. Bundling reduces transaction costs of a CDM project as a significant part of the CDM cost is fixed; for example costs of developing a baseline, management and legal costs related to processing the project through the CDM cycle, and cost of search and negotiation related to selling CERs. It is obvious from this that transaction costs per project will be less if bundle has more than two projects. The projects within a bundle benefit from standardised baselines and streamlined procedures for validation, monitoring and verification. Therefore, per project transaction costs for bundled projects are expected to be much lower than what they would have been if the individual SSC Project were to be taken through the CDM route to sell its CER separately. However, bundling costs can be expected to reduce with experience and further simplification, making bundling attractive even for two projects.

“It is not clear how the process of bundling will actually lead to lowering of transaction costs. The process of bundling needs more clarity and work to demonstrate the commercial viability of the bundling organization.”
- Stakeholders, IT Power Workshop, 2003

Enabling regulatory environment: CDM transaction rules explicitly permit bundling of SSC projects. Except for the requirement that bundled project cannot be larger than the SSC projects threshold size, there are no restrictions on bundling of SSC projects.

Favourable Environment: Since bundling facilitates inclusion of small-scale projects, it may be possible to take CDM benefits to rural communities and provide them with quality energy and other services in an environmentally friendly manner, since it would be easier to get additional support needed, if any, in the current international political environment.

An IT Power study²⁰ findings on bundling are included in **Box 5**.

Box 5: Findings from study on Bundling of Small-scale CDM projects

- The value of CER generated is outweighed by the transaction costs. However, CDM could also provide an income stream making a project more attractive to financiers.
- Bundling enables the transaction costs to be shared over several projects.
- Although transaction costs of bundled projects are likely to be higher than those for a single project, they may be lower than overall transaction costs of individual projects.
- The bundling organisation is also likely to face increased risk since it has little control over the success of these projects, and ultimately the emission reductions from each.

3.2 Bundling –Case Studies²¹

Where are the bundles? Hardly any bundling cases have been considered by the EB. Bundling being a fairly complex exercise, involving multiple issues relating to homogeneity, ownership, sampling, etc, bundlers of SSC projects are hesitant to take the first step to steering bundled projects through the CDM process.

Some small projects, when bundled in large numbers, may cross the small-scale activity threshold. In that event, although the projects may not be able to take advantage of all the simplified provisions for small-scale activity²², bundling could still be preferred due to other advantages such as use of benchmark baselines, simplified monitoring requirements, reduced transaction cost (due to bundling) etc. Several such projects are also in proposal stage or in pipelines. However, the EB may have to take a view on how to deal with such bundles and methodology may become clear after that.

Some bundles, either in the pipeline or at the idea / preparation stage by various entities are illustrated below.

²⁰ IT Power and KITE, 2002.

²¹ The case studies discussed in this section are merely representative bundling ideas (unless otherwise mentioned), and are not completed CDM transactions.

²² One of the reasons apparently cited for rejection of the Energy Efficiency Projects Bundle – Water Pumping, India (NM0044) is that SSC rules could not be used for this (http://cdm.unfccc.int/UserManagement/FileStorage/CDMWf_884923449); the bundle comprised five municipal corporation water pumping upgradation projects, and crossed the SSC project size threshold.

Renewable Energy Projects Bundles – Biomass, India

The PDD for a bundle of Renewable Energy projects has been submitted by Desi Power, an equipment seller/ technologies provider, in respect of 9 biomass gasifier based power projects sold by it in South India. Each project is owned by a different entity, and has a different timeline for commencement and completion.

Renewable Energy Projects Bundles – Hydel, Honduras

The project in Honduras- *Cortecito (5.3MW) and San Carlos (4.0 MW) small-scale hydro project-t* contains two hydro power plants, is that a bundle of two projects, the same is the case with the two other projects in Chile- *Methane capture and combustion from swine manure treatment for Pocillas and La Estrella* and *Methane capture and combustion from swine manure treatment for Corneche and Los Guindos*.

Renewable Energy Projects Bundles – Community Kitchens, India

This bundles community kitchens to be installed in institutions such as hospitals, schools and religious ashrams in several Indian states is under development by Factor Consulting + Management AG to compensate for the CO₂ emissions. Solar energy is planned to be concentrated and used to generate steam for cooking purposes, while substituting kerosene, diesel or other carbon emitting fuels. The total project will provide daily carbon-neutral meals for around 30,000 people. The CER buyers are The German Ministry for Environment, Nature conservation and Nuclear Safety and intend to buy the CERs at a premium price of around €10/tCO₂e.

Energy Efficiency Projects Bundle – Small Boilers, Peru

This bundling project involves over 100 small boilers (Oko Institut, 2003). This project proposes to improve the energy efficiency of these boilers and it seeks to achieve this through setting-up of institutional arrangement and procedure that would facilitate the bundling.

Energy Efficiency Projects Bundle – Industrial Boilers, Guatemala

A potential bundling project consisting of 700 medium-sized industrial boilers in Guatemala has been proposed for development (Grutter and Burki, 2001) to replace second hand refurbished inefficient boilers with efficient ones. In this case also individual CDM projects for the boilers are not viable but bundling is an attractive option.

The World Bank's Community Development Carbon Fund (CDCF) is involved in bundling of various community projects, and some of their bundles may also be bigger than the size of small-scale activity.

Renewable Energy Projects Bundles – Biomass, Kenya

Substitution of fuel oil with biomass will reduce the costs of heat generation for tea processing in six tea factories (owned by small holders), increase the revenues of nearly 20,000 tea farmers and increase returns 20%. Moreover, 600 to 800 smallholder farmers will obtain new forestry income and employment opportunities.

Renewable Energy Projects Bundles – Wind-Hydro, South Africa

A combined 7 MW wind facility-5 MW hydel plant project will generate peak load power, and help create new jobs and encourage small and medium enterprises.

Renewable Energy Projects Bundles – Biogas, Vietnam

60 MW of cooking gas will be generated by setting up 100,000 biogas plants between 2005 and 2007. Switch over to biogas means negligible smoke and improved indoor air quality/ better family health, besides the organic fertiliser from the residual bio slurry.

Renewable Energy Projects Bundles – Biogas, Nepal

Over 60,000 Biogas plants will be set up over a 21-year period to bring fuel for cooking and lighting for rural households. The project will generate a total of 1.8 million tons of emission reductions during the first crediting period of 7 years, starting delivery in 2004. The CDCF expects to purchase a minimum of 1,429,000 tons of emission reductions over a 10-year crediting period.

Energy Efficiency Projects Bundle – Sugar Production, Colombia

120 small and medium-sized traditional brown-sugar manufacturing plants will retrofit existing, farm-based facilities and building a central manufacturing plant using high-efficiency boilers that will eliminate burning of firewood and old tires, besides adopting organic practices in sugar-cane production.

Energy Efficiency Projects Bundle – Fly ash bricks, India

Clay bricks will be substituted with fly-ash bricks for the construction sector - 200 tiny sector units spread throughout India, each with an annual capacity of about 3 million bricks, generating annual emission reductions of 387,240 tons of carbon dioxide equivalent. The CDCF expects to purchase a minimum of 1,400,000 tons of carbon dioxide equivalent over a 10-year period.

Energy Efficiency Projects Bundle – Heating, Mongolia

Reconstruction and modernisation of 40 base load boilers using coal will reduce carbon emissions for district heating. Proposed project works with a builders association.

3.3 Use of standardised methodologies in bundling

Conditions to use of standards: It is not feasible to establish a baseline for each project that forms part of a bundle. Doing so will have serious cost and time implications. Pre-developed baseline and monitoring methodologies help reduce monitoring costs arising from a full fledged and extensive monitoring program that would impose very high costs on the small-scale project. A benchmark baseline would be a simpler and acceptable alternative. Small-scale methodology provides the benchmark baselines but actual application of a benchmark baseline to a bundle of project would require- (i) creation of bundles comprising homogenous projects, and (ii) synchronisation of project development design and development parameters to fit CDM baseline methodology and technical criteria. Therefore, the bundling process has to be undertaken with care.

3.4 Risks in Bundling

For the same amount of CER generation, bundling reduces risks associated with failure of one big project by pooling the risk across various projects. Besides pooling the risk, bundling reduces the default risk also due to multiple projects and involvement of several entrepreneurs. However, bundling adds another dimension to the risk. The bundler has a very limited control over various projects in the bundle; for example in community projects involving various SHS or biogas plants. Bundle may

contain many projects, which in turn may have different parties involved in implementation and the financing, and the bundler may have little control over the success of the projects, and hence on CER generation from the projects.

In an analysis of bundling risks and costs using case studies of potential CDM projects in Ghana (IT Power and KITE, 2002), it was concluded that despite viability of bundling in some cases, the risks are too great for most commercial enterprises to invest in establishing a bundling organisation. The conclusion was reached considering that the bundling organisation has little control of the projects and of projects failing could be high depending on number of project developers involved. Since a bundled project can include a large number of developers and financiers depending on the bundle, the risk may be unmanageable for a private bundling organisation. However, the perception of risks involved in bundling appears to be somewhat different in case of India, where stakeholders' response appeared quite positive to the bundling in the workshops conducted by the IT Power in 2003. Therefore, bundling may soon catch up as a line of activity for some businesses, but market may still not be mature for a full-fledged bundling organization.

The composition of the bundle has some bearing on the risk perceptions around it. Some of the issues related to composition of bundle and related risks are:

- Renewable energy projects have proved to have higher than normal rates of failure compared to normal projects.
- If the size of the projects in a bundle is large, failure of even a few constituents may severely impact the quantum of CER issuance and the risks for the buyer.
- On the other hand if it is small, despite the diversification of risk that comes with a portfolio of projects, the redundancy risks for small-scale projects may be high.
- A heterogeneous bundle of projects may represent a better risk than a homogenous bundle. For example, considering past record of biogas projects in India, a homogenous bundle of biogas projects may be a risky investment proposition.
- Smaller projects in general are less equipped to deal with CDM-related requirements.
 - Sampling methods used to verify/ certify CDM projects have to be liberal enough to bring down transaction costs without impairing the integrity of the CERs.

To put their projects through the CDM process, SSC project developers have to pay the high costs upfront without any guarantee that their projects will be approved by the EB and qualify to get the CER. This has deterred several projects. One of the business solutions is that bundlers with adequate financial capacity undertake the upfront costs and bear the risks. This then is a value addition from bundling.

Are SSC Projects more risky? CDM projects in general face several technical non-compliance and CER-shortfall risks. Bundlers may be unsure whether CER will be generated by a SSC project, which faces higher degree of business and technical risks than large projects operating in the same environment. Apart from the need to cover up the shortfall with the ultimate buyer of the CER, the bundler may have to recover

the advance monies paid to the SSC project developer in the event the CER is not issued. This is possible if the advances are collateralised by bank guarantees or similar mechanisms. But then the SSC projects may not have the financial resources to provide this comfort to bundlers.

Long-term risk: The long-term nature of the CDM process – sometimes extending over 10 years, if project implementation time is also considered – brings a host of business and commercial risks that many bundlers may not have the capacity to bear. These risks are common to CDM projects and may not be peculiar to SSC projects per se.

Bundling diversifies business risks: By sourcing CER from several projects comprising the bundle, the risk of non-receipt of CER is reduced. Bundlers must endeavour to over-collateralise their portfolio – i.e. they must build in extra cushion to ensure that if there is a deficit in CER issuance by one project, another will compensate the shortfall. No special risk-mitigation mechanisms may be required.

The risk mitigation in bundling can be done through combining the project activities with other similar activities; for example linking GHG projects with other energy efficiency and technology change activities (Grutter and Burki, 2001). The bundler can also take safety margin in CERs contracts with buyers, and bank the surplus CERs in the event of successful delivery of CERs by all the projects in the bundle. Insurance can also be taken out by the bundler to hedge for non-delivery or shortfall. It can be serious issue in case of some projects; for example, in the IT Power workshop in 2003, it was commented by Indian Renewable Energy Agency (IREDA) that 45% of the renewable energy projects fail.

3.5 Legal issues in Bundling

Devising a suitable legal structure for the transaction: The business of trading in CER is evolving - it may not be possible to crystallize on one legal structure for all CDM projects. The legal framework will have to address cross-border issues of contracting, since there are differences and inconsistencies across laws in different jurisdictions. Specifically, for each project, the timing for the bundler to pay CER sale proceeds to the project developer – whether paid in advance at (a) start of the bundling process, (b) approval by the EB, (c) issuance of the CER, or (d) actual sale of CER, will impact the legal risks and decide the configuration of the legal documentation and safeguards that will have to be put in place to protect the interests of the bundler as well as the SSC project developer.

Exclusivity of ownership of CER: Since the bundler is likely to act as the CER seller, ownership will need to be transferred to the bundler (except when the project developer itself is the bundler), and therefrom to the ultimate buyer. The bundler will have to institute technical and legal safeguards against the SSC project developer selling the CER more than once.

Contractual framework: Bundlers will typically have to enter two contractual situations in the sale of the CER originated by the SSC project:

- Sale to the bundler: CER issued by the SSC project to the bundler (except when project developer itself is the bundler).

- Sale by the bundler: Onward sale of the CER to domestic/overseas buyers.

The latter is not discussed as it falls within the scope of general contracting for CER. Legal protocols should be standardized and the bundler should enter into appropriate Emission Reduction Purchase Agreements (ERPA) to formalize the long-term relationship for buying the CER, and specifically state legal remedies in respect of the following issues:

- Non-issuance of CER.
- Business failure of the parties.
- Changes in technical configuration and non-compliance with technical parameters.
- Sale of CER to a third party.
- Recover of advance monies paid to SSC project developer.
 - Resolving conflicting claims to ownership of CER.
 - Addressing disputes in verification

Reduction of legal costs: A fairly complex legal structure needs to be devised and put in place for each project. Legal costs can be a high component of the costs of putting a project through the CDM process. Use of Standard contractual templates can help define legal structures and enable SSC project developers reduce their legal costs.

3.6 Are Taxation issues relevant?

Taxation of the income from the sale of CER will increase the transaction costs for the project developer. If appropriately contracted, it may be possible for the project developer to defer the incidence of taxation. Local tax rules may need to be modified; for example, in India, a ‘bundled CER transaction’ may face double taxation of the sales proceeds – first in the hands of the project developer when he sells to the bundler, and second when the bundler sells the CER in the market. In any case, taxation can increase transaction costs significantly and reduce the financial attractiveness of the CDM transaction further.

3.7 Can bundling make a difference?

It has been observed that even with the simplified modalities and procedures, small-scale projects remain unviable; and hence reducing transaction costs further for small-scale projects is critical to improving access to the CDM market. Therefore bundling as a way forward to reduce transaction costs further assumes importance. With added transaction costs and changed risk profile, which may be either way (higher or lower risk) depending on the type of bundle and other factors, can the bundling deliver? Some case studies (IT Power and KITE, 2002) indicate that bundling of SSC projects can help to improve the financial viability of projects under certain circumstances. It is too early to make a verdict on the promise from bundling, but if the limited past experience is any indication, when several CDM projects have been developed despite several unresolved methodological issues, bundling costs can be expected to come down significantly and bundling problems resolved amicably.

This however brings the issue of capacity building of stakeholders for bundling as well as for the CDM in the forefront. Institutional capacity in the developing countries to process CDM projects and facilitate bundling may need to be developed. Adequate

information and database in addition to development of local competence and linkages are also prerequisites for success of SSC projects through the CDM process as well as for bundling.

4. Bundling

Analysis of Transactional Issues

4.1 What can be Bundled?

Virtually any type of small-scale projects can be selected for bundling, and any combination of small-scale CDM projects can be bundled, so long the bundle meets the small-scale size criteria. There are no restrictions related to technology or category of the projects, or on the stage of implementation of the projects for bundling.

At a workshop on bundling small-scale CDM projects (IT Power, 2003), project developers identified three criteria for bundling - (a), multi-technology projects; (b) Single technology, multi-location; and (c) project where Overall Monitoring plan can be prepared.

In a study on CDM for Cambodia (Sum, 2004), a list of candidate projects for bundling was brought out, which contains similar projects as identified by Indian stakeholders. The potential projects identified for bundling in Cambodia are;

- Micro/household activities, which includes household biogas systems, improved cook stoves, solar home systems, and Pico/micro hydro systems.
- Small-scale industry activities, which includes wet waste biogas-electricity; soy bean factories, establishing mini-grid for local supply, rice husk/wood waste gasification, improved brick kilns design/efficiency, hotel energy efficiency improvement.
- Local governmental activities, which includes community / provincial town waste composting (aerobic reduction), provincial town sewage treatment (methane capture).
- Forestry, which includes agro-forestry, small-scale farmers planting income generating, and community forestry regeneration of degraded land.

4.2 Who are the Bundlers?

“Organisations which could facilitate bundling are most likely to be financial institutions, energy service companies, EPC²³ Contractors, industry associations, insurance companies, manufacturers and consultants.” - *Stakeholders, Workshop conducted by IT Power, 2003*

A number of entities can be potential bundlers, and each one of them has some strength and weaknesses when it comes to the skill sets available with them for bundling. Some of the possible bundlers have been discussed here.

²³ Erection, Procurement & Construction

Project Developers

Different projects, with same or different baselines, can be aggregated by the project developer itself, the direct owner and beneficiary from the cash inflows accruing from the carbon credits generated by the projects. Project developers have full control over the projects and to that extent risk of non-delivery of CERs failure is low. They also have much more at stake than CERs in a project, and as a direct beneficiary, can be expected to have high commitment to the success of the project.

However, bundling is not the main business of project developers– they may not wish to devote managerial and financial resources to this non-core activity. Faced with uncertainties of non-approval by the EB and volatile price scenarios for carbon credits, project developers may not be willing to risk the upfront costs in steering projects through the CDM process.

Example: Energy Efficiency in Office Buildings

A large software company, installing energy-efficient lighting and cooling measures in its various offices across the country. Individually, each project is too small, but when aggregated, the bundle attains a reasonable size for claiming carbon credits.

Example: Energy Efficiency in Commercial Buildings

For example, one of India's leading hotel companies is simultaneously implementing energy efficiency measures in its chain of 5-star hotels across the country.

Example: DSM measures in a utility company

For example, an electric utility implementing a series of Demand Side Management projects over a 3-4 year time period can aggregate its projects.

“One of the viable bundling option is to bundle SSC Projects being established by an entrepreneur in multiple locations.” – *Sahasratronics Private Limited, Project Developer*

Project Consultants

Project developers are advised by project consultants to design, build and operate projects that generate carbon credits.

The consultants have strong domain expertise in specific technologies and the necessary skills to prepare the PDD and help design and build projects that conform to CDM criteria. They have the advantage of expert understanding of the projects and the networking to facilitate the CDM process.

However, consultants may not be able to structure complex commercial deals for facilitating the CDM process;

- they have inadequate capacity to fund the upfront costs of steering projects through the CDM process
- normally are small size and disinterested in diversifying into businesses outside their core competencies

“Willing to prepare PDD, work as baseline and methodology experts, but Project Developers should pay for efforts” – *Project consultant*

Example: Tiny energy efficiency projects

For example, in India, a project consulting company, which is conducting energy audits and advising several diamond-cutting units on use of energy-efficient motors could bundle each of the projects – often installations of under 5 motors each.

Energy Service Companies (ESCO)

ESCO have strong technical competencies like consultants, and may also have the comprehensive technical and financial capacity to set up and run energy projects. The ESCOs are familiar with various techniques and methodologies for measuring and verification of baselines, energy savings etc. ESCOs are also comfortable in working with performance contracts, similar to the one that may need to be executed for delivery of CERs. Therefore, bundling projects that they own/ manage for CER purposes is a natural extension of the business. It can also reduce risks for them. They can build a suitable portfolio of projects to mitigate the risk of failure.

However, the ESCO business model has to be fully established and made operational in most of the developing countries. ESCO need to have adequate financial capacity (most developing country ESCOs may not have such capacity)

“ESCO may consider bundling similar types of projects, as work involved would be less and the CDM assistance will improve cash flows and be risk-mitigative to some extent.” – *Project consultant*

Example: Energy Efficiency projects in local water utilities

An ESCO which supplies energy efficiency solutions for water pumping systems to local water utilities (called Municipal Corporation in India, which supplies water to a city) can bundle up 5-10 municipal corporations whose projects are homogenous.

Suppliers of Equipment

A seller of EE or RE equipment/ services could bundle up the projects sold by it, either directly out of its internal finances or in the form of a specialised fund. Additional revenue from selling CER may give the equipment supplier a competitive advantage in the form of reduced prices for the equipment. Normally, bundling may be limited to only projects in which the supplier is involved with directly.

However, in most cases, a supplier of equipment and services has limited control over the project once the equipment has been sold. Except in the case of turnkey projects, there are very few instances of equipment that may be capable of independently generating carbon credits. Most equipment sellers may not be in a position to commit financial resources towards an activity that is far removed from their main business of selling their products.

Example: Supplier of Solar Home Systems

A large supplier of solar home lighting systems has constructed a bundle of solar home systems sold and serviced by it to rural households in South India.

Example: Supplier of EE solutions to municipal corporations

Supplier/ service provider of energy efficient lighting solutions can bundle the portfolio of projects at various municipal corporations.

Example: Turnkey supplier of Biomass gasifier power plants

In India, Desi Power, a supplier of biomass-based gasifier power plants, has bundled 9 of its projects (generating power up to 2.25 MW). None of the projects are owned by it and each of the projects is set to start/ end on different dates.

Industry Associations

Industry or associations/ groupings closely aligned with a set of homogeneous businesses could be bundlers. This is possible when there is a common cause for implementing GHG mitigating measures in the industry – such as fuel switchover by transport operators, technology upgrading necessitated by changing business circumstances, etc. Industry associations can accelerate the adoption of common measures across the industry in a short span of time. Apart from generating additional revenue from/ for its members, the industry associations often have financial resources or serve as the mechanism for pooling funds from its members to bear upfront costs and steer the projects through the CDM process.

Industry associations lack the technical resources to understand and implement CDM-related technical issues. There may not be commonality in the equipment and service providers for the projects established by the members, and this may cause several inconsistencies and deviations

The success of the bundling exercise hinges on the associations' ability to convince its members to follow baselines and methodologies consistent with those specified for CDM process.

“A bundling exercise was initiated, whereby similar EE projects in one industrial cluster were aggregated in a Special Purpose Vehicle (SPV) formed by the local association of entrepreneurs. The bundling failed because the SPV / association did not have any financial strength and did not want to take on any liabilities / penalties. Lack of know-how and expertise in selling CER also emerged as a major barrier.” –
CDM India, project consultant

Example: Association of manufacturers implementing EE projects

Small apparel manufacturing units in a large industrial area installing energy efficiency equipment can qualify their projects for bundling through the manufacturers association whom they are members of.

Example: Associations of transport operators switching fuel

Associations of transport operators – heavy commercial vehicles, buses, taxis, auto rickshaws – can form bundles out of the pollution-control measures – such as CNG conversions not dictated by statute – initiated by their members

Banks and Financiers

Several eligible CDM projects are funded by banks and other financiers. Often, they have portfolios of similar projects, which can be bundled together. The project developer will formally assign the ownership rights to the carbon credits to the Banks/financiers.

Financiers may not have capabilities to verify and monitor projects and the monetary gains from sale of CERs may not be significant. Moreover, they are unlikely to have commitment to the bundled projects beyond the expiry of their financing period, leading to possible interruptions in CER issuance.

Bundles may be built up over a period of time as financing of similar projects takes place. Often, projects may have dissimilar baselines and monitoring methodologies.

Microfinance institutions could also explore role of a bundler, especially for rural and community based projects (**Box 6**)

Box 6: Could Microfinance Institutions Bundle Rural Projects?

Among banks and financiers, micro finance Institutions (such as Grameen Banks in Bangladesh and India) emerge as strong candidate for bundling community-based projects. Many small-scale projects are expected to be in rural and semi-urban areas, where normal finance institutions neither have reach nor capacity to handle (due high transaction costs) such projects. In such cases micro finance institutions may be better placed as bundlers. Their involvement can make such projects attractive; for example small-scale renewable energy projects, and thus helps rural development. Micro finance institutions are also best placed to address issue of risk in such projects due to their links and proximity to project developers in rural areas. An added advantage could be improved access to finance to the poor. However, micro finance institution may be technically on a weak footing so far CDM process is concerned. They may also find it difficult to get expertise and technical support for small-scale projects in rural areas.

“The Bank is interested in exploring the prospects of bundling its portfolio of small-scale projects, especially the following:

- Portfolio of households who have installed solar water heating systems
- Portfolio of households who have installed solar home systems
- Portfolio of energy efficiency projects

“It is unable to obtain reliable advice in formulating a business plan for bundling. It appears to be inclined to bear the upfront costs of bundling. The incremental revenue will be useful to meet peripheral costs of running special loan programmes and may be used to provide incentives to small-scale projects. The Bank also would gain a competitive advantage in the market.” – *A bank during the consultations*

Possibility of an energy efficiency fund as a bundler has been discussed by Grutter (2001) (**Box 7**)

Box 7: Energy Efficiency Funds as Project Bundlers²⁴

Energy efficiency funds could play an important role in bundling potential CDM projects, Example, a boiler project. The advantage of an energy efficiency fund would be that it could incorporate various types of small projects (with differing baseline) thus allowing a diversification of risks and a more continuous and higher inflow of GHG credits and it could also incorporate various income sources to allow for additional finance for technology renovations. However, not all countries have such dedicated funds. Also, other advantages and disadvantages for a fund like this will be similar to that of any other finance institution.

Example: Karnataka Urban Infrastructure Development and Finance Corporation has formed a bundle of 5 municipal corporation water pumping projects.

Example: Indian Renewable Energy Development Agency (IREDA) could bundle its portfolio of windmill projects.

Example: Canara Bank and Syndicate Bank, along with several other banks, could bundle solar home heating/ lighting systems that have been financed by them.

Example: State Bank of India could bundle the projects financed under its Project Uptech, a loan programme for funding energy efficiency projects.

Example: ICICI Bank, which partners USAID in its ECO Project, can bundle its portfolio of similar EE projects.

“The Bank is interested in bundling CDM projects since they have several linkages with Project Developers” - ICICI Bank

Buyers of CER

The most financially resourceful entities in the whole CDM chain could be the buyers of the CER. They are able to quote the best prices and have better holding power.

However, buyers of CER may get involved only in later stages of the development of eligible projects, mostly towards the stage when CER are issued. They may lack the local networks and resources to undertake search for projects, carry out the technical protocols required under the CDM process and exercise supervision over the performance of the bundle.

“Being in a unique position to bring together varied CDM-eligible projects across the world, GVEP feels that the market for carbon credits is still evolving and in view of the uncertainties associated with the CDM process, bundling of small-scale projects is still sometime away.”
 - *Global Village Energy Partnership Secretariat*

A comparison of the probable bundlers’ skills is shown in **Table 6**. It is to be noted that this is not a generic grading of the potential bundlers: this grading reflects, (a) situation peculiar to India; (b) is based on the perception of the expertise of the

²⁴ Grutter, 2001.

potential bundlers by a limited number of experts, and (c) is based on interpretation of the terms used here by the graders. For example, a low grading of Project Developers on knowledge of the CDM and project cycle reflects typical project developers in India (and not specialized CDM project developers).

Table 6: Grading of skill-sets of different bundlers²⁵

Skill	PD	PC	ESCOs	ES	IA	B	CER
Good knowledge of CDM and project cycle	1	5	3	1	2	1	4
Experience of project identification & development	4	5	3	2	1	1	1
Risk taking ability	4	1	2	1	1	4	4
Access to finance	4	1	1	2	1	5	5
Linkages with the carbon finance market	1	2	2	1	1	2	4
Expertise in technical & contractual matters	4	4	4	2	1	2	4
Control over the projects	5	2	5	1	1	1	1

Notes:

1. Legend: *PD* – Project Developers; *PC* – Project Consultants; *ESCOs* – Energy Service Companies; *ES* – Equipment Suppliers; *IA* – Industry Association; *B* – Banks & Financiers; *CER* – CER Buyers

2. Ratings: 1 = Worst / Lowest; 5 = Best / Highest

3. Explanation of terms used:

Equipment Suppliers refers to small manufacturers (i.e. excluded are large MNCs); *Banks and Financiers* refers to developing country lenders (i.e. not MNC banks with a presence in developing country; not much interested in small-scale activities; *Buyers of CERs* as bundler refers to carbon credit brokers / traders in Annex B countries. Theoretically they can come from anywhere but outsiders are not expected to come and bundle at their risk in Developing Countries. They would at most come as consultants.

Good Knowledge of CDM and Project Cycle – Reflects past experience / exposure to the Kyoto Protocol and various CDM projects related accords / documents, national and international institutions / organizations / stakeholders as well as processes / procedures etc.

Experience at project identification and development – Experience as well as influencing ability in the identification and development of CDM grade projects only. Specifically excludes the appraisal skills to gauge the commercial / financial / technical viability of a project or the credibility / creditworthiness of the developer -- that are not specific to the CDM process.

Risk taking ability – Ability to take risk on the basis of inherent financial strength; in a position to create, lead, and influence the small-scale CDM market. Includes willingness to take risks.

Access to finance – Degree of comfort sought by the Lenders for extending debt finance. The more comfort (securities, guarantees, collateral etc.) is sought, less is the access to finance.

Linkages with carbon finance market – Previous experience in dealing with carbon-credit traders, carbon funds etc. and familiarity with their contracting, buy-price expectations, views on quality of CERs as well as with emerging trends like carbon instruments, spot market etc.

Expertise in technical and contractual matters – Large spectrum of experience that covers various legal, regulatory, negotiations expertise as well as knowledge / awareness of new applications of existing / mature technologies, trends in emerging technologies and their potential applications etc.

Control over projects – Ability to influence the pace at which a small-scale CDM project progresses at any stage of the CDM project cycle.

²⁵ Based on Delphi method, involving four authors of this paper.

5. Business Modelling for the Bundling Organisation

The Business entity

5.1 What is a typical bundling organisation expected to look like?

There are several possible bundling entities in developing countries, but may need capacity development before they are ready to take up this role.

Bundling of SSC projects is expected to pick up gradually, and bundling of SSC projects may remain as one of the many lines-of-business of a potential bundling organisation; at present, it looks unlikely that specialized bundling entities, in which bundling is the only (or the main) line of business, will spring up in the immediate short term.

Some entities that are already in CDM-related businesses may look at bundling opportunities to leverage their capabilities with their existing lines of business. For some organisations, engaged in some CDM related services, bundling could be a natural extension of their business on account of synergy with their business. Some examples are;

- A specialized fund for CDM projects, which acts as a broker in CERs of CDM projects, and also provides or arranges technical services
- An entity that offers consulting and / or ESCO services to project developers, and selectively buys and sells CERs;²⁶ and

5.2 What kind of projects can be expected to be bundled?

The bundling possibilities can be summarised as follows:

Category 1: Large projects are bundled along with small projects, whereby at current transaction costs and CER prices, it becomes viable to take the small projects through the CDM process because of the cost cushioning by the larger projects in the same bundle. This means that large projects that are 10MW or less can form part of a bundle that may be expanded up to 15 MW (the current ceiling under the CDM rules) along with a set of small projects who generate around 5 MW.

Category 2: Some relatively smaller projects – for example, 3 renewable energy projects, each of 4 MW capacity, the transaction costs are spread out across the bundle; and

Category 3: This will probably be entirely a bundle of very small projects – for example, 10,000 solar PV home-lighting systems, each of 50 W_p capacity, or 75,000 energy-efficient refrigerators, each with reduction in consumption by 200 W, who with simplified procedures and use of local consultants/ localised DOEs, can be made viable.

The opportunities associated with the three categories of projects are likely to be different – as also the risks. For example, the unresolved issues relating to sampling of

²⁶ Selectively, because a consulting firm or ESCO in many cases may not have a sufficient fund size.

projects for verification / certification may increase the risks in respect of Category 3 projects:

The probability of bundling Category 2 projects is higher because they may be:

- Homogenous projects in terms of both size and type (for example, 6 run-of-river small-hydro power plants, each of 2 MW) or
- Homogenous projects in terms of type (for example, 3 small-wind farm projects, each with a different make / size of wind turbines, and respective wind farm capacities being about 3 MW, 4 MW and 7 MW)

5.3 What will a typical bundling organisation do?

A bundling organization may:

Case A: itself initiate a bundled project (for example, three wind farms, each in the 3-5 MW range), or

Case B: simply obtain the CER rights from project developers of a bundle of projects that have been initiated by another organization (for example, an Equipment Supplier).

Although there may be certain differences between these two situations, either way the bundling entity would legally transfer the CERs from the entrepreneurs / developers to itself, to act either as broker or trader of CERs.

The possible role of the various stakeholders engaged in the bundling activity may be briefly summarized in **Table 7**.

Table 7: Stakeholders and their Roles

<i>Stakeholder</i>	<i>Role</i>
Project Developers	<ul style="list-style-type: none"> • Invest in project assets • Generate and sell CERs to bundling organization
Project Consultants	<ul style="list-style-type: none"> • Prepare PDDs • Assist bundling organization in buying the CERs
DOE	<ul style="list-style-type: none"> • Validate, verify, certify • Register the project with CDM EB
Bundling Organization	<ul style="list-style-type: none"> • Formulate and structure the project • Seek approval from DNA • Manage the work of project consultants, DOEs and other tasks leading to registration²⁷ • Buy emissions reduction CERs from the project developers • Syndicate, negotiate and sell CERs
CER buyers	<ul style="list-style-type: none"> • Buy CERs from bundling organization

²⁷ Only if the Bundling organisation is itself spearheading the development of small-scale projects for bundling.

5.4 Organisational Structure and Strategy for a Bundling Organization

5.4.1 Skill-sets and Competencies

Good knowledge of CDM and project cycle, experience of project identification and development, access to finance, linkages with the carbon finance market, and expertise in technical and contractual are essential skills for bundling (findings from a India workshop in **Box 8**)

Box 8: Skills needed in a bundling organisation

Proven strength in project management, knowledge of CDM, hands on experience in project development, and the ability to pool resources from different organisations, access to potential CDM project developers, availability or access to expertise in financial, technical, project appraisal, contract/legal, knowledge of the CDM process, and local/international regulations and policy developments, the financial standing of the organisation. Those deemed desirable: credibility to project developers, brand, commitment & motivation to CDM, marketing skills, ability to raise finance, exposure running of sustainable development operations.

- *IT Power Stakeholder workshops on Bundling in India, August 2003*

Other than specific CDM technical skills, bundling organisations must develop other commercial competencies:

Marketing: Identify prospective project developers, Equipment Suppliers, other stakeholders such as NGOs, etc.

Networking: Linkages with CER buyers, DOEs, DNA, etc.

Legal: Knowledge / understanding of the legal and regulatory issues

Development of / access to information databases:

Development of an adequate knowledge management system that becomes progressively sophisticated as the bundling business grows, whether it is in-house or outsourced. Relevant information databases should be identified and tapped on an ongoing basis. In-house skills to gather, assimilate and analyse information should be strong. Some of the information inputs that will be required are:

- **Information to gauge the in-country competitive environment:** This will include, but not be limited to a tracking of the activities of other emerging bundling entities, transaction costs of such bundled projects, how they leverage their existing strengths and relationships, the type of contractual relationships they enter into etc. Such information would help the emerging bundling entity to develop its own positioning and operating strategies.
- **Information to track the changing global and in-country legal and regulatory environment:** This will include, but not be limited to a tracking of changing priorities of the following that may impinge on the profitability and / or focus of the bundling entity, such as (a) government and DNA policy pronouncements regarding sustainable development and overall developmental priorities, legislation that make it mandatory to carry out certain type of activities (for example, CNG based road public transport systems in specific cities / townships), tax treatment of inventory of carbon-credits etc., or (b) new global developments regarding small-scale projects and their bundling (for example, sampling for verification / certification and other measures that may reduce

transaction costs), emergence of new financial instruments for trading of carbon credits, policies / priorities of institutionalized players such as the Prototype Carbon Fund, Community Development Carbon Fund, the European Emissions Trading System, etc.

Development of External Linkages:

Development of linkages with various stakeholders, both in-country and outside, are critical to identifying technical resources (such as DOEs) and marketing (for example, buyers of CERs). Some of the important linkages required within the home country right from the beginning are:

- The DNA and other relevant government organizations (if any).
- Organizations that work on capacity building programs.
- DOEs that have established an in-country presence.
- Legal advisors
- Project Consultants
- Experts in specific technical areas of interest
- Equipment Suppliers

Overseas linkages that may be similarly useful include:

- Brokers / traders (with an interest to off-take CERs on behalf of ultimate buyers) who have business interests in the home country.
- Donor agencies that are involved with capacity building programmes.

Development and management of suitable processes and systems:

Appropriate internal systems and processes have to be efficient to:

- Gather and assimilate information from databases and other external sources.
- Facilitate the brokerage or arbitrage business.
- Facilitate risk management .

Manage Costs:

Transaction costs will include:

- Direct project related costs that are incurred by the bundling organisation (such as cost of PDD preparation, validation, verification, marketing, etc.).
- Legal expenses.
- Direct employee costs for interfacing with the various stakeholders during the CDM process.

Organisational Overheads will normally include costs for office space and related infrastructure.

Cost of Capital will be the cost of investment in CERs (when the bundling organisation pays for and buys out the CERs from the project developers). If the bundling organisation merely acts as a broker, the cost of capital would be negligible.

5.4.2 Broker or Banker?

The most convenient option for a bundler would be to be a broker to the bundling transaction without investing in buying the CER from the project developers. This means that the bundler uses its local presence to package SSC project sellers and overseas networking to search for CER buyers.

This business model is useful for bundlers who leverage their considerable technical, networking and project-spotting abilities to identify projects, facilitate the CDM process and obtain good pricing for their bundles. Their real skills will lie in negotiating good prices for both seller and buyer. This may be the least financial investment strategy.

Banking of CER by buying off carbon credits from SSC projects, warehousing them for a certain period of time and selling them at a later date is a more expensive investment strategy for a bundler. Although returns may be high, bundlers should have deep pockets not only to pay the seller of the CER but also bear the upfront costs leading to the issuance thereof. The risks of price volatility are very high, and in the event that CER are not generated, the bundler will face high counterparty risks – i.e. it will be unable to deliver to prospective buyers if the sellers fail to generate the required carbon credits.

5.4.3 Timing of payments

Timing refers to the payment of upfront costs and the CER sales proceeds – when are the relevant payments made, and by whom. Wherever the bundler is also the project consultant responsible for developing the PDD and carrying out the validation and registration process, it may be a competitive necessity to absorb the upfront costs of this facilitation and recover it out of the sales proceeds. This will mean a long investment period and risks of uncertainties with (a) approval/ registration by EB, and (b) generation of CER, and (c) realization of a sale price remunerative enough to cover the upfront costs and make a reasonable profit. The advantage of this strategy would be an aggressive project retention strategy and the buying of future CER from the project developer at lower rates, taking into account the discounting of future cash flows.

Typical payment/ transaction timing situations are:

- SSC project developer pays upfront costs, in lieu for services leading to the approval/registration of the project.
- Bundler bears the upfront costs in lieu for including the SSC project in the bundle, and buying out of CER rights at a predetermined price or price formula.
- Payment of CER sales proceeds is deferred to a date nearer to issuance and/ or sale of the CER.

“Clients are willing to explore the possibilities of obtaining CDM benefits, but they want the project consultant to give them guarantees that it will happen.” – *Rajesh Deshpande, project consultant*

At present, bundlers are facing up to business realities. SSC project developers do not have the financial capacity to bear the upfront costs for the CDM process, in which case for the bundling to succeed, the bundler has to make the necessary investments. Even where they have the financial capacity, they seek assurances from the bundler on the surety of the approval/ registration by the EB, failing which they are not interested in the transaction or the bundler loses the deal. Hence, the bundler may have to make a financial commitment and/or provide guarantees if it wishes to close the transaction.

In the present circumstances, project consultants do not want to be bundlers unless the Project Developer or some one is willing to bear the upfront costs. It may also be possible to reduce billing to the minimum extent if variable costs – travel, communications, etc - are reimbursed by the Project Developer.
- An Energy Consultant

5.4.4 Capacity of the Bundler

To clinch a CER deal, a bundler may have to (a) pay the SSC project developer the upfront costs involved in the CDM process or (b) pay the sales proceeds in respect of CER to be issued in the future after the SSC project is implemented.

The bundler has to have sufficient financial and risk-taking capacity to build the bundle:

- (a) Have the funds to pay the upfront costs
....and face the possibility of the EB not approving the project
- (b) Have the funds to pay the sales proceeds in advance of issuance of the CER
.....and face up to the risk of non-delivery of the CER
.....and bear the risk of not obtaining a remunerative price at the time of sale of the carbon credits

It is unlikely that the bundler will obtain commercial finance from banks (as is the case at least in India) in the normal course and will have to raise funds internally. There are no risk-mitigation products available to hedge the CDM-specific risks of (a) non-performance, and (b) price volatility.

“Higher volumes are essential for the Bank to consider bundling as business. As a facilitator, funds-provider and bundler, the technical work relating to the CDM process will be sub-contracted to project consultants, but interfaces with OE, MoEF and the MP/ EB will be direct. Alternatively, the Bank is not averse to investing in the upfront costs for a share of the CER proceeds from the SSC Project Developer.” –
ICICI Bank

5.5 Building the Bundle

Beyond the size limitations stipulated by the CDM EB, bundles would comprise of various combinations of homogenous and heterogeneous projects of various sizes, and bundles comprising over 10,000 small projects may not be uncommon. However, the composition of the bundle will be a key determinant to the funding and structural risk issues around that bundle. Similarly, different approaches may have to be adopted in the verification and measurement methodologies.

Development of localised technical skills is crucial to reducing transaction costs, especially those on account of work undertaken by a DOE. Transaction costs are likely to be important determinants of the composition of the bundles – types of projects that will be bundled together, or the number of projects in the bundle. Costs

are likely to vary significantly depending on whether the DOEs involved are either (a) based out of developed countries such as, say, European Union countries, (b) operating in the local country with the help of their own offices, or (c) using local consultants as their associates.

5.5.1 Ownership of bundled projects

Two possible models for the bundled projects are (Grutter, 2001):

- (a) SSC projects are the joint owners of the bundle.
- (b) The bundling organization buys out each of the project developers and becomes the single owner.

There are no stipulations in the CDM rules as to who can register the bundle of projects with the EB and claim CER. However, once the bundle is formed, all entitlements to claim the carbon credits passes on to the bundler and it should not be permissible for an individual project developer to unilaterally unbundle and sell the CER separately. Therefore, legal documentation has to ensure that the bundler enjoys unfettered and absolute rights over the CER for the duration of the bundling/ crediting period.

One possibility is that, in the bundling process, the individual projects are not identified or named – only the generic category of projects are listed in the documents submitted for registration with the CDM EB. In other words, the portfolio of projects will be populated over a period of time as and when the actual projects are specifically selected for inclusion in the bundle. It is not clear whether the EB will grant approval for a bundle where only the generic description of the constituents is put up for approval/ registration in lieu of specific names.

Can the bundle be broken up? This situation may arise for various reasons; for example;

- (i) The project developer who is a constituent of the bundle does not wish to surrender the carbon credits for any reasons whatsoever, which may be either (a) breach of contractual conditions by the bundler or (b) typically if the CER fetches a better price from another bundler. This has to be viewed in the context of the fact that the individual project has no separate identity for CDM purposes and can logically be attached to another bundle provided other conditions, especially on time scaling, are met. Some guidance in the above issue may be available in that the CDM rules permit project activities to be bundled or portfolio bundled at the following stages in the project cycle: the project design document, validation, registration, monitoring, verification and certification. This seems to suggest that bundling/ re-bundling may be possible within the existing framework of rules.
- (ii) An individual project developer may choose to opt out of the bundle at any point of time ahead of the end of the crediting period. The same can happen with a bundler who ceases to manage the bundle prior to the end of the target-crediting period. An instance is when a bank-bundler stops claiming credits in respect of projects that are excluded once the respective loan is repaid.

Can the bundler transfer the bundle to another entity – there is no clear answer. Adequate safeguards should be built in to ensure that there is no duplication of projects in different bundles. Project developers must confirm the exclusivity of the sale of their CER to a bundler. In the event that a project developer opts to unbundle and re-bundle with another bundler, the OE should ensure that the possibility of double counting of a re-bundled project is eliminated.

5.6 Bundling Criteria and Strategy

5.6.1 Homogeneity in Bundling

There are no strictures in the CDM rules as to whether the bundle can be comprised of projects following different baselines, methodologies and monitoring techniques. It merely requires that if project activities are bundled, a separate or overall monitoring plan shall apply for each of the constituent project activities or the bundled projects, as determined by the designated OE at validation to reflect good monitoring practice appropriate to the bundled project activities and to provide for collection and archiving of the data needed to calculate the emission reduction achieved by the bundled project activities.

Therefore, although bundling of projects across various small-scale categories is theoretically possible, in reality, the purpose of bundling to reduce transaction costs may be defeated. A single baseline set of methodologies and single category of projects means reduced transaction costs for PDD, validation, registration and monitoring. For example, it would be easy to bundle a number of motor efficiency projects but difficult to combine them with a micro hydro project. Baseline as well monitoring plan will be different for the two, increasing the transaction cost. Therefore, homogenous bundles are likely to be the order of the day, at least in the initial phase

Homogenisation will help encourage bundling of small-scale projects, but it is necessary first to identify which projects are homogenous. This may be a simple task, such as bundling of PV home lighting systems, but may not be so in other cases such as, say, cogeneration of power. For the purpose of homogenization, it is necessary that the bundled projects conform to benchmark baselines, besides using similar technologies that are amenable to monitoring through standardized protocols. For example, even in a PV lighting project, it is possible that the baseline is different – could be grid power, kerosene, biomass or any such fuel/ source. Therefore, it may be necessary to help potential bundlers by identifying common homogenous permutations in selected categories of projects in respect of which simple baseline and monitoring methodologies have been approved by the EB. A typical problem in bundling very small-scale projects is illustrated in **Box 9**.

“Project developers identified projects which can be bundled together: small hydro, poultry litter, cogeneration, rice husk biomass, solar power plants, cycle rickshaws/diesel, treadle pumps, solar home systems, biomass, energy efficiency measures for buildings, process energy efficiency, gas operated water/space heaters in buildings, demand side energy efficiency.” - Stakeholders, Workshop conducted by IT Power, 2003

Box 9: Example of methodology problems in bundled projects

If a **bundle of solar heating systems** were to be formed, the bundle may be a mix between heating systems installed in households (the biggest buyer of solar heating systems) and those larger systems in institutions such as schools, hotels, etc. In order to reach the ceiling on such projects, it will require several hundred projects to comprise a bundle. In such circumstances, validation, verification and monitoring of CER will not be possible unless:

- benchmark baselines are adopted for all constituents uniformly, which may not be possible since each household may use different baseline sources of energy – grid, kerosene, biomass, etc.
- sampling techniques are used to validate, verify and monitor the CER, since it may not be feasible to visit each household even once in the full term
- enough safeguards are in place to handle redundancy if any constituent disposes of or otherwise stops using the solar heating systems

5.6.2 Geographic location of the Projects

Homogeneity could be extended to geographic location also, as it might be a good strategy to choose projects to bundle, which are either in same geographic location or in conditions that would be similar. This again would help in having a common baseline, monitoring plan and minimize cost in meeting other such requirements.

5.6.3 Stage of Projects development

Further extension of homogeneity could be to stage of developments projects are in. It would be easy to bundle projects in same stage of development. But for strategic or other reasons bundler may choose to bundle projects with different investment profile on time scale. For example, to spread risk, financing reasons and so on.

Criteria may vary across countries and bundling organisation based on their strengths and weaknesses. Some other criteria for project selection, as given in a study, and mentioned during a stakeholders' workshop are given in **Box 10**, and **Box 11** respectively.

Box 10 : Selection Criteria for Bundling Small-Scale CDM Projects²⁸

In a case study of small-scale projects for bundling, the following criteria were suggested for bundling of projects:

- High CER regimes (at least 20,000 tCO₂/year) - this could be from a few high CER generating projects or many very small projects;
- Significant percentage of the net revenue from CERs (e.g. >10%);
- Regions or countries with established frameworks for CDM;
- Common elements for baseline standardisation.

The more criteria that are fulfilled, the greater the likelihood of a successful bundling project, however and the ultimate success may then rely on the effectiveness of the bundling organisation itself.

²⁸ IT Power and KITE, 2002.

Box 11: Project developers views on criteria for selection of projects for bundling and other requirements for bundling

Project developers in a workshop (IT Power, 2003) identified three criteria - Single location, multi-technology projects; Single technology, multi-location; and project where Overall Monitoring plan can be prepared. Project developers identified the CDM project development and CDM pre-feasibility evaluation as the capacity building needs. It was also felt that there is need for more consultants and resource person to guide the process. Low awareness among small project developers was identified as the barriers in development of small-scale CDM projects. High transaction cost associated in the development of PDD was identified as another barrier for small-scale CDM project. Cap on the size of bundle was also recommended to be removed to bring down the transaction cost.

5.6.4 Size of the Bundle

The size of the bundle should not exceed the limits stipulated for SSC projects in the CDM rules. The number of projects that comprises a bundle is not relevant except that it may increase the transaction costs in certain circumstances - such as in designing methodologies for monitoring the projects.

“How does a bank bundle different types of projects that it funds over a period of time?” – A bank during the consultations

In the study (Sutter, 2001) of small-scale projects, Sutter argues that when similar projects are bundled together, costs for project development and transactions can be reduced in a relevant magnitude. Projects, which show good financial performance without being burdened by additional transaction costs, become viable within a bundle. The transaction costs involved are shared by all projects included in the bundle. The increase of the bundle size from 10 projects to 100 will not provoke major changes to investment behaviour within the analysed set of projects. Further, the analysis shows that bundles of 10 or more units can turn several types of SSC projects into viable CDM projects. The projects within a bundle benefit from standardised baselines and streamlined procedures for validation, monitoring and verification.

5.6.5 Time scale for building up bundle

CDM rules permit project activities to be bundled at the following stages in the project cycle: the project design document, validation, registration, monitoring, verification and certification. Further, the crediting period starts only after the date of registration of the proposed activity as a CDM project activity. In exceptional cases, the starting date of the crediting period is permitted to be prior to the date of registration of the project activity.

A bundling process cannot be continuous. Bundling has to be completed within a stipulated timeframe (i.e. building up of the bundle) - Assuming that the bundle starts/ends on stipulated dates, there is no assurance that the bundle could be made up to the pre-determined volume within the stipulated time frame. Therefore, it may be necessary to “over-collateralise” the bundle – i.e. plan the bundle around asset of projects, which are more in number/ volume than what is required to ultimately generate the target CER – in other words, built in a certain quantum of redundant projects.

Another problem in the case of bundles with several projects is the uncertainty associated with approval and registration of CDM projects. The cut-off date for inclusion of projects in the bundle must be clearly established to avoid any invalidation by the EB.

Bundlers may face additional risks resulting from having paid project developers in anticipation of registration with the EB, but ultimately is unable to include them in view of the delays in synchronizing the credit period, the formation of the bundle and the registration of the bundle.

6. Conclusions and Recommendations

Concrete measures to catalyse bundling of SSC Projects

6.1 Brief Conclusions

Small-scale projects have large potential for the CDM in several countries, and seem to be predominant in small and poor developing countries. Small-scale projects also promise sustainable development – they are especially strong on the social dimension, and allow community participation. From geographical equity perspective also, small-scale project assume importance for CDM as most of the projects in Africa and Asia are expected to be small-scale projects.

However, high transaction cost is a major barrier to small-scale CDM projects. However, transaction costs are coming down as local expertise develops and procedures are simplified. Responding to the need to reduce transaction cost, the CDM Executive Board has simplified methodologies for small-scale projects - baselines, PDD, monitoring and verification requirements, registration fee etc. - and allowed them to be bundled.

But even with simplified methodologies, a large number of small-scale projects remain unviable due to risks and high transaction cost.

Bundling of projects, that helps to spread risk and transaction costs across various project in the bundle, emerges as one of the solution to bring more small-scale projects into the CDM arena. Bundling however is still in the infancy and all the problems related to CDM process, such as complicated CDM project cycle, baseline problems, need for fast tracking by the national authorities, lack of institutional and expert capacity, and high transaction cost are barriers. However, development of local expertise in CDM process has already brought down CDM transaction costs substantially, and it can be expected in case of bundling also.

There is no dearth of ideas on what kind of projects can be bundled and stakeholders appear to be well aware of the opportunity on this front. Several bundles have either been submitted to the EB or are in the pipeline. These include a variety of bundles from biomass gasifiers in India and biogas plants in Nepal to industrial boilers in Guatemala.

Although bundling reduces risk by spreading it across a portfolio of projects, it has its own risks related to a lack of control over multiple projects and failure. Local taxation and legal issues may also to be handled in bundling, impact of which on the project may vary across countries. Despite these issues, bundling offers opportunity to bring small-scale projects in the CDM process.

Bundlers may need a variety of skills such as understanding of CDM and project cycle, expertise to identify and develop project, risk-taking ability and market linkages. In the existing industry set-up, a number of organisation have promise to take up role of bundler. Of these project developers, ESCOs, and financial institutions

appear to have requisite skills and capacity to be a bundler as extension of their existing line of business. Bundlers will need to devise an appropriate model for their operation and strategies may include operating mode as a broker or a banker of CERs, selection of projects using appropriate criteria such as homogeneity, size of bundle etc.

Institutional and capacity development issues are very important in bundling, as they improve information transparency, deepen market linkages and help reduce transaction costs, thereby making bundling an attractive business proposition. Development of databases, customization of procedures to local levels and building adequate base for information exchange and developing external linkages in countries / regions are other important issues. Therefore, in this initial stage of development, there is a lot of scope for technical and funding support from international agencies, development agencies and donors.

Considering that many small-scale projects, that offer sustainable development, are not viable option for CDM due to high transaction costs, it makes sense to support the early development costs. This can be achieved in many ways; one through direct support to capacity development and learning, as well through support to implementation of CDM bundles. It can also be promoted through premium pricing of the CERs from small-scale projects, and from such bundles. Sustainability can be given a premium so that the support goes to truly deserving projects. Initiatives of the CDCF through development of SSC projects are a good beginning in this direction.

6.2 Recommendations for a Plan of Action

Bundling is still in the stage of evolution and several agencies and stakeholders are looking forward to it becoming operational. Agencies working actively in this area include several donors and international development agencies, consulting organisations and technical experts, and other technical support organisations. Most of the recommendations here are for DNAs, international development agencies, donors and the EB, who may need to work with consulting organisations, international experts, and local organisation to move forward on the bundling.

Establishing a Technical Secretariat :

The CDM site of the UNFCCC is currently a good source of information on CDM methodologies and examples. In addition, there are several sites on international organisations and NGOs offering valuable information on CDM. Yet these cannot substitute the function of a technical secretariat, who could be reached by stakeholders from developing countries for support, at least until their capacity has been built-up. This could be encouraged by the UNFCCC / EB with donor support.

The technical secretariat, with the help of DNAs and other experts, could serve the following purposes;

6.2.1 Capacity building and setting up a database

- Creating the **technical resource base** for use by prospective SSC project bundlers. This is to help CDM project developers and bundlers access high

quality information. It could also include helping them in identification of sources of information for preparation of PDD and presenting cases at the CDM Executive Board.

- Facilitating **capacity building** amongst stakeholders. This would help create more awareness about CDM protocols. It could include suggesting and initiating training and facilitating measures to provide other suitable infrastructure support to project developers, regulators, technical service providers and other stakeholders.
- Providing a common **discussion forum** for issues relating to bundling of SSC projects. It means sharing learning experiences of stakeholders in various countries and exchange of information on bundling problems and issues, including guidance for bundling.
- Supporting relevant organizations to act as agencies **for lobbying policy** changes with governments and provide inputs / feedback to the CDM Executive Board. This means help in creating a SSC project-friendly enabling environment. It could also include facilitating framing business strategies and suitable policy framework for catalyzing development of bundling business opportunities, in consultation with relevant local organizations, Government and other stakeholders.
- Assisting in developing **linkages within and outside the country** for technical support and sale of CER. This could help reduce transaction costs and improve price realization. Facilitation of exchange of information and experiences on SSC projects and more use of local technical resources could help bring local stakeholders closer to the global marketplace for CER.
- Supporting the process of **standardizing** new baselines and methodologies. This could also include streamlining the process of approaching the CDM EB. Rendering technical and financial support to develop baselines and methodologies in select project areas could also be considered.
- **Publishing** information relating to bundling of SSC projects, which may help learning from experiences of various project developers and bundlers. It would mean documenting case studies of bundling in the country and outside for suitable guidance to other projects.

6.2.2 Help in customising baselines/ methodologies

- **Identifying a few SSC Project areas** (say five to begin with) that have high potential with a view to create a template for select CDM project activities using different approaches to bundling, which may be used as a guide for similar projects.

It would require evaluating project areas that are likely to attract maximum bundling activity but where entry barriers to bundling are high. Bundling in each project area may involve different technologies, bundling entities, geographies and technical service providers including DOE.

- Help in developing **standardized Baselines and Methodologies** in respect of each of the identified CDM project areas. This will reduce transaction costs and uncertainties relating to approval by the EB and make technological expertise available off the shelf.

This would require examining and determining simplified baseline and methodology issues for the selected project areas as well as developing PDD templates and streamline databases for information collection and analysis.

- Providing technical support for **localization of Baselines and Methodologies** considered by the CDM Executive Board, wherever needed. Transaction costs and uncertainties will be reduced further by localizing baselines and methodologies, and learning from past mistakes.

The support could also include analyzing projects considered by CDM Executive Board and diagnose the reasons for approvals/ rejections/ reconsideration, and providing guidance for tackling problematic issues.

6.2.2 Support in originating and steering bundles of CDM Projects through the CDM EB

- Facilitating bundlers / project developers in **identifying and bundling**, say five different SSC projects (as model project bundles). It would require providing support to execute bundling transactions through the full cycle of the CDM process and disseminating the learning. It could also help in setting up benchmarks for pricing of CDM-related services and developing linkages with the market.

The model bundling transactions could be originated and executed in partnership with a bundling organization, preferably in the same project areas identified as having maximum potential. Technical service providers, including DOEs could be involved in this.

- **Meeting the upfront costs** of bundling on behalf of the project developers for the model bundling projects. This would help overcome entry barriers for up-front investment by project developers and bundlers.

Financial support for the up-front costs of the bundling exercise in the form of a conditional grant to the project developer/ bundler, subject to recovery out of the revenues generated from sale of CER could be tried out in the model projects.

- The model bundling projects could be carried out through competitive bidding. This may help build a free enterprise model for transactions in bundling, encourage competition, reduce costs and broad base technical skill sets.

Several DOEs and technical service providers could be involved in the bundling exercise through competitive price bidding for services. This could also help set benchmarks for costing of similar projects. Local expertise could be used as much as optimally possible in such cases.

6.2.3 Setting up online web portal

- A **web site** for SSC projects could be designed and set-up. It would help reduce costs of accessing the CDM market and improve information transparency. This could be extended to an online platform for dissemination of information and trading in carbon credits.
- **Bringing together stakeholders** – primarily project developers, bundlers, technical consultants and buyers of CER, which would help create a competitive market place. The portal could serve as a meeting place for stakeholders for enabling free market enterprise.
- Developing an online platform for **facilitating bidding** for technical and other tasks relating to bundling of SSC projects - preparation of PDD, validation, verification, etc.

Providing wider choice of service providers, improved pricing information and acting as a shop front for CDM-related services would help reduce costs.

- Developing an **online trading platform** for buying and selling CER of pre-EB and post-EB SSC project bundles. This would open up a low-cost forum for sale of CER. It would require formulating strategy for using the web site as a trading platform for buyers and sellers of CER.

6.2.4 Developing a bundling tool kit

- Identifying and consolidating information on bundling **procedures** and **best practices** so that bundler has good technical resources available.

It would require creating a dynamic database for disseminating information of global and local CDM practices, including guidance notes.

- **Devising legal templates** for contractual issues relating to bundling such as Emission Reduction Purchase Agreements. This would help streamline legal requirements for CDM process and reduce costs. It would require standardising legal protocols, including contracts, studying cross-border legal issues and derive solutions in the local (country) context.
- **Qualifying** project consultants, bundlers, DOEs and other agencies for undertaking bundling tasks, which would help in getting a choice of intermediaries. Project developers and bundlers will be able to get a wide choice of service providers and evaluation of quality and cost of services.

6.2.5 Help in establishing a Prototype Bundling organisation

- Facilitating the establishment of a **model bundling organization at the local level** (feasible in big countries). It would help demonstrate how bundling can be done in a commercially successful manner.

It would require partnering suitable entities for prototyping a typical bundling organization and disseminating the learning experiences to showcase skill-set and structural matters.

- **Building capacity** to develop business model, information database management, market linkages and technical resources. This would require developing a template for a viable bundling organization, including framing a suitable business structure for the model bundling organization.

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Consultations With Stakeholders - Summary of Discussions

Views of several stakeholders – Project Developers, Project Consultants, Energy Service Companies, Banks, Bundlers, Fund Managers, and Government officials – were sought and taken into consideration in coming to the conclusions in this Report. The consultations were carried out during March-April, 2004.

By and large, most stakeholders have limited knowledge of CDM related issues and even less on bundling of SSC projects. However, the SSC project sector is very large in India and it is generally accepted that most of the CDM project grade initiatives are likely to come from this area.

Policy and regulatory intervention is required

Ministry of Environment & Forests, Government of India:

- Government will play the role of a moderator and bring various stakeholders together
- Develop sector specific baselines, encourage Indian entities to register as OE and streamline regulatory procedures for approval of CDM projects within India.

Ministry of Non-Conventional Energy Sources, Government of India

- Simple and standardized baselines for renewable energy projects will help maximize potential opportunities available through CDM by encouraging priority projects that meet national environmental and development goals and technology needs.

Fund Manager:

- Indian conditions have to be taken into account by the CDM Executive Board

Project Consultant:

- There is lack of clarity on what policy intervention is required to encourage bundling of SSC projects

There are several knowledge gaps

Bank:

- Confusion and lack of clarity on several CDM issues, especially the qualifying criteria, baselines and methodologies

Bank:

- Where does one get advice on bundling of projects?

Multilateral Bank:

- The main job at the moment is to evolve standardized and localized baselines and methodologies for CDM projects to emulate

Project Consultant:

- Basic technical expertise for preparing PDD, validation, verification, etc, are available within the country, and use of local expertise is a solution to reducing transaction costs
CDM process is uncertain and difficult

Various stakeholders:

- Technical knowledge gaps and time delays are major constraints for SSC projects
- There is no clarity on how to undertake CDM projects

Project Consultant:

- Projects run the double risk of incurring upfront costs without having assurances on acceptance of the CDM project by the Methodologies Panel and/ or the Executive Board
- In view of the uncertainties, neither the project developer nor the bundler will bear the burden of paying for the upfront costs of PDD preparation, validation, registration, etc.

Sale of CER is not an attractive business proposition

Project Consultant:

- Transaction costs are high, beyond the financial ability of most SSC projects, and not worth the effort of going through the CDM process.
- There is no certainty on earnings from CER

Bundler:

- Bank's expectation of return from CDM projects are too high and deter prospective projects
- Banks fund CDM grade projects routinely without considering CER revenues

Ministry of Non-Conventional Energy Sources, Government of India

- Reduce administrative costs by bundling similar small projects into a single project that is still eligible for fast-track procedures.
- Standard baselines minimize transaction costs and facilitate project development.
- Appropriately designed fast-track procedures can help improve administrative feasibility and reduce transaction costs.

Bank:

- Revenues from sale of CER are not high enough to justify the costs; it is difficult to satisfy the financial additionality conditions

Project Consultant:

- Costs have come down in the last 2 years with increasing localization by OE and competitive pressures

How to go about the bundling process

Bank:

- How are projects to be chosen for bundling?

Bundler:

- Limited knowledge, poor financial strength and inability to sell CER constrain bundling
- Ideally bundle several projects established by a project developer at different locations

Bank:

- Banks can bundle projects they have funded
- Bank is interested in bundling SSC projects, but where are the volumes to make it viable?

Project Consultant:

- Not interested in bundling unless project developer pays up costs upfront

ESCO

- Easier to bundle similar projects that ESCO is working with

Fund Manager:

- Both trading and broking opportunities can be tapped by bundlers.
- Upfront cost issue - quote cum/ex-prices for buying CER from project developers
- Till larger business volumes justify a full-fledged establishment for bundling CDM projects, outsourcing to external experts and consultants is a solution for the present.

Project Developer:

- Can bundle own projects at different locations

Bank:

- Designated energy consumers should form a fund to fund bundling of projects

Maximum CDM potential is in Small-Scale Projects

Ministry of Environment & Forests, Government of India:

- Encourage a cluster approach to bundling to ensure maximum demonstration and visibility

Energy Planning Consultant:

- 80% or more CDM grade projects in India are small-scale in nature

Project Consultant:

- Most CDM projects generate less than 10,000 tons of CER annually

GVEP Secretariat:

- The market for carbon credits is still evolving, and in view of the uncertainties associated with the CDM process, bundling of SSC projects is still sometime away.

Special acknowledgements are due to the following stakeholders:

- | | |
|-------------------------------------|---|
| ▪ Ministry of Environment & Forests | ▪ Ministry of Non-Conventional Energy Sources |
| ▪ Canara Bank | ▪ Nashik Municipal Corporation |
| ▪ CDM India | ▪ Parakh Foods Limited |
| ▪ EcoSecurities | ▪ Sahastronics Limited |
| ▪ Energetic Consulting Services | ▪ Saket Projects Limited |
| ▪ Global Village Energy Partnership | ▪ Selco India |
| ▪ ICICI Bank | ▪ Shell Foundation |
| ▪ IREDA | ▪ TERI |
| ▪ IT Power India | ▪ ThinkSmart Solutions |
| ▪ Lucknow MSW Project | ▪ WSD |
| ▪ MEDA | ▪ Yagna Engineers |
| ▪ Ernst & Young | ▪ Asian Development Bank |

Annexure 2

Excerpts from *Annex II of decision 21/CP.8 Simplified modalities and procedures for small-scale clean development mechanism project activities*

– References to bundling by CDM EB

<http://cdm.unfccc.int/Reference/Documents/AnnexII/English/annexII.pdf>

- Project activities may be bundled or portfolio bundled at the following stages in the project cycle: the project design document, validation, registration, monitoring, verification and certification. The size of the total bundle should not exceed the limits stipulated in paragraph 6 (c) of decision 17/CP.7 (§9.a)
- Several small-scale CDM project activities may be bundled for the purpose of validation. An overall monitoring plan that monitors performance of the constituent project activities on a sample basis may be proposed for bundled project activities. If bundled project activities are registered with an overall monitoring plan, this monitoring plan shall be implemented and each verification/certification of the emission reductions achieved shall cover all of the bundled project activities. (§19)
- The small-scale project activity conforms to one of the project categories in appendix B and uses the simplified baseline and monitoring methodology for that project activity category as specified in appendix B, or a bundle of small-scale project activities satisfies the conditions for bundling and the overall monitoring plan for the bundled small-scale project activities is appropriate. (§22.e)
- Project participants shall include, as part of the project design document for a small-scale CDM project activity or bundle of small-scale CDM project activities, a monitoring plan. (§32)
- If project activities are bundled, a separate monitoring plan shall apply for each of the constituent project activities in accordance with paragraphs 32 and 33 above, or an overall monitoring plan shall apply for the bundled projects, as determined by the designated operational entity at validation to reflect good monitoring practice appropriate to the bundled project activities and to provide for collection and archiving of the data needed to calculate the emission reductions achieved by the bundled project activities. (§34)

Recommendations
Use of capital letters
Links
More documents of EB