



A document of the UNEP FI Climate Change Working Group · January 2005



Purpose

This study is the fourth in a series of reports by the Climate Change Working Group (CCWG) of the UNEP Finance Initiative. The first was a scene-setting paper on the risk of climate change in 2002. The second paper (2003) confirmed the sector's support for emissions trading as a key financial tool. The third paper presented the business case for financing renewable energy and made policy recommendations for further action on the issue.

This fourth paper focuses on the Clean
Development Mechanism and pinpoints
barriers to implementation and financing of
CDM projects as seen from the financial sector
perspective. Recommendations on how these
barriers can be overcome are provided.

Finance for Carbon Solutions

The Clean Development Mechanism: The Financial Sector Perspective

CCWG Statement

The Kyoto Protocol's Clean Development Mechanism (CDM) is a unique instrument in international climate policy. It supports the implementation of sustainable and environmentally friendly technologies in developing countries, and helps industrialised countries meet their emission reduction obligations in a cost-effective way. The potential market size for Certified Emission Reductions (CERs) from CDM projects is remarkable: according to the European Union, an estimated annual 430 million tons of CO₂ must be reduced worldwide in order to meet the Kyoto Protocol's emission reduction targets. It is hoped that a significant share of this volume will come from CDM projects. This will require, however, significant financial resources. The financial sector is often asked to play an important role in this respect, and, in particular, to provide project financing and/or insurance for CDM projects.

In practical terms, the efficiency of the CDM depends largely on its design. Although the potential market for CERs exists, the current appetite for private banks and insurers to become engaged in projects is rather low. At present, the activities in the CDM market are dominated by multilateral institutions (e.g. World Bank) and national governments, which have to meet different risk/return requirements compared to private players. Clearly, the low level of private engagement is due to the specific risk structure of CDM projects, various institutional barriers, and the complexity when implementing a CDM project.

How can these barriers be overcome?

UNEP FI's CCWG recommends thorough consideration of four key issues:

- Simplify, standardise and streamline the CDM process: in order to attract more financial institutions, a faster, more efficient and more user-friendly project registration process must be in place;
- Provide prompt and clear guidance on the CDM regulations beyond 2012: without a clear long-term framework for the CDM, it will be difficult to attract financial institutions to CDM projects;
- Foster the development of institutional CDM capacities in both host and investor countries;
- Rethink the interpretation of additionality: the current methodology used for additionality assessment often deters private financial institutions from engaging in the CDM.

Climate change: Financial instruments and markets

Human induced climate change poses major risks not only to our environment and human health, but also to our economic systems. According to Munich Reinsurance, the frequency and cost of global natural disasters is increasing - to more than \$60 billion in 2003, a quarter of which was insured. These challenges have to be dealt with. On the one hand, financial institutions have developed various risk transfer mechanisms that mitigate the financial risks of climate change for their clients and themselves, such as weather derivatives and catastrophe bonds (see box 1).

On the other hand, there are numerous markets addressing policy regulations on a variety of environmental and climate change issues including acid rain from sulfur dioxide (SO2) emissions or ozone pollution from nitrogen oxide (NOx) in the US. Also new markets are developing involving 'green power' products such as Renewable Energy Certificates (RECs), which foster the development of renewable energies in a cost-efficient way. More importantly, the global market for greenhouse gas emissions under the Kyoto Protocol offers significant opportunities for financial institutions. The Kyoto Protocol is breaking new ground with the incorporation of three innovative market mechanisms – International Emissions Trading, and the two project-based mechanisms Joint Implementation and the Clean Development Mechanism (CDM).

Box 1: Examples of financial instruments to mitigate climate change costs

Weather derivatives

For weather-dependent business, weather can negatively impact revenues or increase inventory costs. This is especially important in times of a constantly warming climate and an increasing number of extreme weather events. The use of weather derivatives can help to reduce the impact that adverse weather may have on a company's bottom line. A 'classic' weather derivative would be a protection against warm winters for a power company.

Catastrophe bonds

These are designed to transfer exposures taken on by insurance/reinsurance companies to capital market investors. They usually pay investors above average yields, unless the reference catastrophe occurs – in which case investors lose their coupon and/or principal. Catastrophe bonds are used to diversify large portfolios of different assets.

The Gold Standard (GS)

The GS is a high quality standard for CDM and JI projects. It has been developed by the World Wide Fund for Nature (WWF) in consultation with a range of environmental, business and governmental organisations. The GS is intended to ensure an even higher level of environmental, social and economic benefits for the host country than required by the CDM Executive Board. The Gold Standard is now being managed by BASE, a UNEP Collaborating Centre and partner in UNEP's Sustainable Energy Finance Initiative.

The case for the Clean Development Mechanism

The CDM was established by Article 12 of the Kyoto Protocol. Under the CDM, an industrialised country invests in projects in a developing country and obtains credits for achieved emission reductions called Certified Emission Reductions (CERs). The CDM is intended to provide specific benefits for developing countries, including transfer of clean technology, foreign direct investment, localised environmental improvement and an income stream from the sale of tradable CERs. It is also intended to attract private sector involvement through investments in CDM projects from industrialised countries aimed at generating CERs. Through this, the CDM assists industrialised countries in achieving cost-effective compliance with their quantified emission limitations and reduction commitments under Kyoto Protocol's Article 3.

After protracted political negotiations on the actual design of the mechanism, the CDM is finally up and running. The 2001 Marrakesh Accords are the most important legal foundation of the CDM regulations. Since the decision on linking the EU Emissions Trading Scheme with the Kyoto Protocol's project-based mechanisms in 2004, the CDM is widely recognized as a potentially cost-effective tool to comply with the Kyoto Protocol's emission reduction obligations. Consequently, at the CDM Executive Board – the formal governance body to oversee the implementation and administration of the CDM – the pipeline of projects waiting for formal approval under the CDM is continually growing.

The benefits of CDM projects will depend not only on the overall level of investment, but also on the nature of the projects, their economic, social and environmental benefits and the extent to which they generate spill-overs and learning in developing countries. Against this background, even a market for premium (Gold Standard) CERs is about to develop.

Getting the CDM into gear will require financial resources. The financial sector can play an important role in this respect, and, in particular, provide project financing, lending and insurance for CDM projects. However, the current involvement of private financial institutions in CDM projects is rather low. There are various reasons for this, which are addressed in the following paragraphs.

CDM: The fundamentals

Registering a project under the CDM is a long and complex process, requiring a number of additional steps compared to conventional projects (see box 2). A range of new organisations, both at the international and the national levels, has to be involved (e.g. Designated National Authorities and Designated Operational Entities), and a project design document must be developed including a baseline methodology and a monitoring plan. For a CDM project financer or insurer it is important to note that the transaction costs for the additional CDM procedures are often between \$50,000 to 250,000 depending on the project type and size. Based on recent experience, it takes approximately 1 to 3 years to get from the project idea stage to the actual registration of the project. In addition, the future of the CDM is unclear, as there is no decision yet on CDM regulations beyond the first Kyoto Protocol commitment period from 2008-2012.

To ensure the environmental integrity of the CDM, the concept of additionality was developed. Additionality was defined under the Marrakesh Accords as the following:

"A CDM project activity is additional if anthropogenic emissions of Greenhouse Gases by sources are reduced below those that would have occurred in the absence of the registered CDM Project activity." (CDM Modalities of Marrakesh Accords)

As part of a project's additionality assessment, the project developer must pass either the investment analysis or the so-called barrier analysis. Here, the project developer must give evidence that without the CDM the project was not the most plausible economic option or that specific project implementation barriers can be overcome through registration as a CDM project. Despite this challenge, an increasing number of players – especially multilateral institutions and national governments – are getting involved in the CDM helping the CDM market to mature.

Box 2: Comparison of conventional and CDM project cycles	
Conventional project cycle	CDM project cycle: Additional steps compared to conventional projects
Feasibility assessments, e.g. project design environmental, technical, financial feasibility identify partners	Assessment of possible CER delivery how to monitor emissions CER market value whether the project qualifies as CDM project methodology
Project structuring phase, e.g. government permits environmental permits arranging finance	 drafting of project design document (PDD) validation of baseline & monitoring plan approval of host country Carbon Reduction Purchase Agreement registration of the project at the EB
3. Implementation phase, e.g. construct or upgrade plant	■ install monitoring facilities
4. Operational phase, e.g. deliver services	monitoring and verification and/or certification of emission reductions

CER market and project types

CERs obtained during the period from the year 2000 up to the beginning of the Kyoto Protocol's first commitment period (2008-2012) can be used to achieve compliance in this period. This is why a rapidly growing volume of certificates has already been traded. According to the World Bank, almost 61 million tons of project-based carbon certificates for compliance purposes changed hands in the first half of 2004. For the whole of 2003, the figure was 78 million tons, meaning that the traded volumes are likely to double in 2004 for the second successive year. Two projects involving the destruction of Hydrofluorocarbon23 (HFC23) – a very potent greenhouse gas – account for 31% of the entire volume (see box 3).

On the supply side, projects from Asia dominate the market (51%), followed by Latin America (27%), while Africa represents just 5% of the project volume. The demand side of the CER market is currently highly concentrated, with Japan, the World Bank and the Dutch government accounting for approximately 90% of purchases. An increasing number of public players are developing carbon funds in order to fulfil their reduction requirements under the Kyoto Protocol, e.g. Germany, Spain, Austria and Italy. According to Resources for the Future, more than 1,000 projects with an average size of 400,000 tons $\rm CO_2$ equivalents reduction annually need to be approved by the CDM Executive Board in order to meet the expected demand. It seems difficult to imagine that

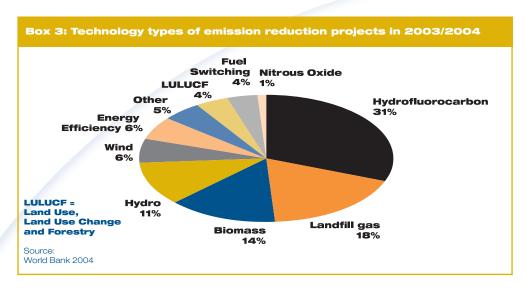


"The implementation of the CDM requires strong incentives to change investment patterns and stimulate technological innovation and maximise real GHG emission reductions."

Dr. Klaus Töpfer

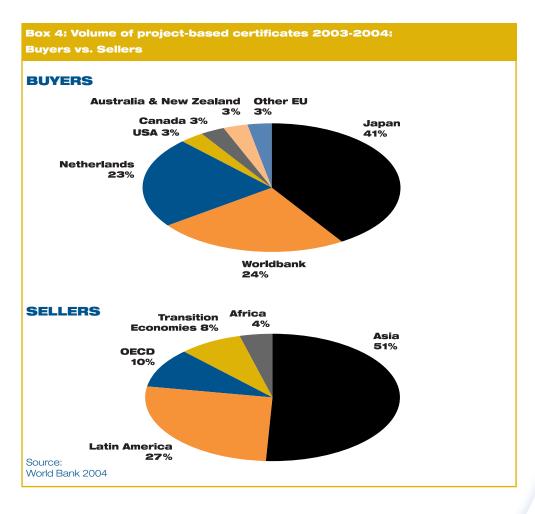
Executive Director,

UNEP



the Board could approve that many projects by 2010 – the future demand for CERs could be much higher than supply.

The current CER price range is between € 3 and 10 per ton, depending on which stage of the CDM project cycle the certificates have been sold at. As with any commercial financial transaction, the higher the risk involved in purchasing CERs, the lower the CER price. Moreover, the ratification of the Kyoto Protocol by the Russian Parliament in October 2004 and the EU Linking Directive that allows CERs to be used within the EU Emissions Trading market will become important CER price drivers in the future.



CDM benefits and risks: a financial sector perspective

The CDM has the potential to generate many benefits for project developers and the environment. For the project developer and the investor, the sale of CERs can secure an additional income stream for the project. Furthermore, the development of an Emission Reduction Purchase Agreement (ERPA) leads to additional scrutiny and risk assessment of the project. Although these

Box 5: CDM Project Risks Type of risk **Description** Risks that are common to all projects in developing and Conventional industrialised countries, e.g. project exceeding costs: e.g. the employed technology needs costly risks repairs or the construction of the project is delayed market risks: e.g. relevant fuel prices increase and the project is no longer economically efficient counterparty credit risk: e.g. risk that the technology provider becomes insolvent underperformance: e.g. non-achievement of design standard efficiency currency risk: e.g. high inflation levels force majeur: an event beyond the control of the involved parties, e.g. earthquake, terrorism attack From a financial sector perspective, projects in developing countries are usually Host country regarded with a higher level of risk than projects in the industrialised world because political of the often less developed legal and political infrastructure, e.g.: risk of confiscation, expropriation and nationalisation of the CDM projects risks (civil) war risk: e.g. risk of riot, strike and civil commotion within the CDM host contract repudiation/frustration: risk that a contract is rendered invalid e.g. by a parliament introducing new legislation credit risk: in particular risk of host country insolvency further administrative barriers: e.g. host country requires various administrative procedures that delay the project 3. Risks that are specific to the generation and sale of CERs, e.g.: CDM CDM Executive Board non-approval: e.g. no registration of the project process by the Executive Board or an already approved methodology is withdrawn risks by the Executive Board CDM risk: there is no CDM beyond 2012 monitoring/verification risk: e.g. inaccurate monitoring by the Designated Operational Entity public consultation risk: non-acceptance of the project by NGOs or local institutional barriers: e.g. the host country's Designated National Authority is not fully established and not working cooperatively with the investor Source: 3C Ltd. **CER legal ownership:** unclear about who is the legal owner of the CERs

advantages are relatively obvious and the CDM market is now more dynamic than ever, there are still numerous risks and barriers to be considered by financial institutions before engaging in a CDM project. Analysing these risks and barriers is even more important considering that the CDM is a very new and complex mechanism and that CDM projects 'naturally' include investments in developing countries, where further external parameters could jeopardize the economic success of the project. For a financial institution, getting engaged in any type of project is always a question of how to identify, allocate and assign the project risks. The main risk categories of a CDM project can be categorised as 'conventional project risks' common to all projects, 'host country political risks' and 'additional specific CDM process risks' (see box 5).

Generally, financial institutions and investors are used to dealing with the first two risk categories. However, the fact that political risks are well known to financial institutions does not automatically mean that such risks can easily be dealt with. Among developing countries, circumstances vary hugely. Often a developing country's political and legal infrastructure is less transparent than in an industrialised country with the result of political instability or a lower creditworthiness, for example. Financial institutions have to set up restrictions for loans in countries where political and economic risks are higher. Therefore, lenders usually set limits on loan volumes and often restrictions are imposed on longer-term transactions.

In principle, host country political risks can be dealt with through the acquisition of insurance from reinsurance companies, development banks or export credit agencies. Insurance premiums must be directly related to the risks involved. Regarding conventional project risks, a promising way to mitigate the risk of a shortfall of credits, for example, would be to impose strong penalties for non-delivery of the CERs or to buy non-delivery insurance. It is important to thoroughly draft the Emission Reduction Purchase Agreement in order to mitigate the risks. CDM process risks are new to financial institutions and can be complex. They require a detailed understanding of the political and legal framework of the CDM, and, for European players, also of the EU Emissions Trading regime and its link to the CDM. There are only a few CDM experts available in the financial sector

at present, hampered further by a limited history of how to mitigate CDM process risks and which strategies to employ successfully.

Further barriers to project implementation and financing

Besides the risk categories outlined above there are other institutional CDM specific risks that pose barriers to CDM project implementation and financing.

Firstly, the CDM process is rather long and often perceived to be inefficient. The CDM registration process is bureaucratic with numerous layers of outside intervention, protracted decision making, review, and options to appeal. There is no doubt about the need for strong and environmentally credible rules to govern the CDM process, but the complexity of the current process serves to obstruct the development of beneficial CDM projects for developing and industrialised countries.

Secondly, the heavy and steadily increasing workload of the CDM Executive Board is obviously problematic. The relatively few resources of the Board to review and approve CDM projects and the currently limited number of accredited Designated Operational Entities to validate the projects for registration and verify/certify the emission reductions are limiting factors for further CDM project development. These contribute to the long time horizons to develop a CDM project.

Thirdly, there is a lack of institutional capacity both in host and buyer countries. Although more than sixty Designated National Authorities exist, in many cases the resources available to these Authorities are not sufficient to provide a 'user-friendly' CDM infrastructure. For example, it is often difficult to obtain the important host country approval for the project or there may be a lack of clarity regarding the host country's sustainability criteria which leads to additional delay.

Fourthly, the project's additionality is often a problematic issue. Clearly, additionality is central to the environmental integrity of the CDM and there has been intense debate about how additionality (according to Article 12 of the Kyoto Protocol) should be tested. However, a project developer who seeks to ensure financing for a project faces a dilemma: within its investment analysis, the CDM Executive Board's decision on 'Tools for Demonstration of Additionality' asks for determination that without the registration as a CDM project, the project activity is not the most economically or financially attractive. This often deters private financial institutions from engaging in the CDM. For an investor, it is important that the project is financially robust in itself, so that the CDM is not the only factor fuelling the project. Few commercial projects are undertaken for one specific reason. Given the CDM risks, it is unlikely that a financial sector institution will undertake a project for CDM reasons alone.

As an alternative to the investment analysis, the Executive Board proposes a barrier analysis to prove a CDM project's additionality. However, the Board must provide more transparency and clarity on the type of evidence that can be accepted to pass the barrier analysis. Otherwise, the risk of failure at the project approval stage will be very difficult to calculate for the involved project

Box 6: Financial solutions for CDM projects in practice Case study: Carbon Delivery Guarantee

Various research has been conducted by the financial sector to develop insurance and non-insurance risk management instruments for the greenhouse gas market as a whole and CDM projects in particular. There is obvious demand from project developers, investors and buyers of CERs for risk mitigating tools for CDM projects. UNEP FI signatory Garant, Global Sustainable Development Project (GSDP) and Swiss Re Greenhouse Gas Risk Solutions are trying to meet this demand with the launch of the first carbon delivery guarantee insurance in late 2004. A carbon delivery guarantee is an insurance product where the re/insurer acts as guarantor for future CER delivery, and financial compensation is paid in case CERs are not delivered according to agreed terms and conditions. The carbon delivery guarantee is shaped to meet the CER buyer's demand for risk mitigation.

One of the first carbon delivery guarantees will be applied to CERs generated by a reduction project in South America, which utilizes an innovative proprietary filter technology. In total, the project consists of 1,000,000 tons CERs. The seller will deliver CERs annually from 2005 to 2007 and the carbon delivery guarantee is based on a purchase price of \$5 per CER. The insurance covers carbon delivery guarantee designed as contract frustration*, political risk insurance (incl. host industry insolvency, seller insolvency, political and country risk) and business interruption.

*Contract frustration insurance protects against losses arising from the host government's breach or repudiation of a contract with the investor. If, after a specified period of time, the investor has not received payment or if the dispute resolution mechanism fails to function because of actions taken by the host government, the insurer will pay compensation.

participants. To ensure the success of the CDM, additionality should be interpreted in such a way as to ensure both environmental and economic efficiency of the CDM (see recommendations). Such an interpretation does not jeopardize the environmental integrity of the CDM. On the contrary, it increases the environmental integrity as it will stimulate global greenhouse gas emission reduction activities. Additionality tests should focus on whether an emission reduction activity has real, measurable and long-term benefits related to the mitigation of climate change and not on whether the potential profits from the CDM are the driving factor behind the emission reductions.

Recommendations:

How can the CDM process be improved?

In order to improve the CDM's economic efficiency without abandoning its environmental integrity, UNEP FI's Climate Change Working Group makes the following recommendations:

- Simplify, standardize and streamline the CDM process: In order to attract financial institutions, a faster and more user-friendly process must be in place. The private players that are supposed to utilize the CDM require further process standardisation, e.g. more Designated Operational Entities need to be accredited and more methodologies must be approved promptly in order to attract more CDM players, particularly from the financial sector.
- Provide prompt and clear guidance on the CDM regulations beyond 2012: With no second commitment period in place, the window for CDM project development is closing rapidly. The interest for CERs generated beyond 2012 is very limited and prices are low. Without a clear long-term framework for the CDM, it will be difficult to attract the involvement of financial institutions.
- Foster the development of institutional CDM capacities in host and investor countries: In many cases the necessary national CDM institutions are either underdeveloped or non-existent. A faster and more efficient CDM process requires clear procedures to be followed by the project participants in both host and investor countries. The parties to the Kyoto Protocol should foster the development of national CDM capacities in order to enhance the investment climate for the CDM.
- Rethink the interpretation of additionality: The concept of suboptimal efficiency seems counter-intuitive and is often perceived as an obstacle by the finance sector. One possible way out of this dilemma while maintaining core elements like monitoring and verification would be to take on a sector-wide approach rather than a project-based approach. A promising option for consideration by the Parties to the UNFCCC is to establish carbon efficiency standards for developing countries in their most carbon-intensive sectors. Any project that would perform better than that standard should be considered a CDM project, contributing to the reduction of carbon emissions in that particular sector.

Conclusion

The CDM has the potential to become a powerful tool in reducing global greenhouse gas emissions. This potential will only materialize if the economic efficiency of the CDM increases substantially. The CDM is still in the early development stage with various 'teething troubles' that pose barriers to its wider breakthrough among the business and finance communities. The CDM is currently a mechanism with high transaction costs and relatively low overall efficiency. The specific CDM risks in combination with the institutional barriers to CDM project implementation and financing are deterring many financial institutions from getting involved in CDM projects.

The key challenges for the UNFCCC Secretariat in the near future are to streamline and standardise the approval process and to register successful CDM projects. The CDM Executive Board might need additional resources to meet these requirements if the volume of project throughput increases.

The CDM was designed to engage the private sector in climate change adaptation and mitigation in the developing world. In order for this to happen, the CDM process must become clearer, more efficient and financially attractive. A significant and positive step in this direction is the implementation of the recommendations presented in this briefing. If these issues are not addressed, and major improvements not made, then the success of the CDM may be compromised, and, potentially, the entire Kyoto process may suffer.



"It is now plain that the emission of GHGs is causing global warming at a rate that is simply unsustainable in the long-term. And by long-term I do not mean centuries ahead. I mean within the lifetime of my children, and possibly within my own."

Tony Blair

UK Prime Minister

UNEP FI

The United Nations Environment Programme Finance Initiative (UNEP FI) is a unique global partnership between UNEP, financial institutions, insurance and re-insurance companies and fund managers. Based in Geneva, Switzerland, UNEP FI has over 200 member institutions worldwide.

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The Sustainable Energy Finance Initiative (SEFI) is a partnership between UNEP FI, UNEP Energy, and the Basel Agency for Sustainable Energy (BASE). SEFI's mission is to promote, facilitate, and support increased investment in energy efficiency and renewable energy. www.sefi.unep.org

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Design and production: Rebus, Paris Printed in France

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