

The Clean Development Mechanism: Special Considerations for Renewable Energy Projects

By the Renewable Energy and International Law Project

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Executive Summary

This paper discusses the barriers and opportunities for renewable energy projects under the Kyoto Protocol's Clean Development Mechanism ("**CDM**"). An executive summary of the issues explored in the paper is provided below.

Part I: Introduction to the CDM

The CDM is intended to be, *inter alia*, a vehicle for investment and technology transfer (including the transfer of renewable energy technologies) into developing countries. Such investment would assist those countries to achieve "sustainable development" by enabling necessary economic growth whilst also reducing greenhouse gas emissions on a global level.

Part II: Barriers to Renewables in the CDM

The first year after the Kyoto Protocol's entry into force has revealed some hurdles in the operation of the CDM which renewable projects must overcome if the CDM is to be a meaningful driver for significant market growth of the renewable energy industry to meet the growing energy demand of developing countries in a sustainable manner.

The key barriers identified in this paper are discussed below.

- Due to the differentiated global warming potentials of greenhouse gases (carbon dioxide, which is displaced by renewable energy, being the least "potent" in terms of its global warming effect), the volume of emission reductions from renewable energy projects is much smaller per unit of output than the volumes created by projects which abate other greenhouse gases such as nitrous oxide, HFC or methane.
- Conversely, the equipment cost of most renewable energy projects is significantly higher per emission reduction than the cost of other types of potential CDM projects, such as agricultural methane flaring projects. The overall contribution of the revenue stream from Certified Emission Reductions (**CERs**) is therefore comparatively smaller for renewable energy projects than for other types of potential CDM projects. As the CDM is essentially a market, CDM project equity investors will tend to go to where "manufacturing costs" are cheapest and purchasers will tend to seek out a plentiful supply of CERs for minimum transaction costs. Renewable energy projects are therefore at a comparative disadvantage in the CDM compared to projects which reduce other types of greenhouse gases.
- In addition, renewable energy projects such as wind farms have a long operation life which (for projects being constructed today), will extend far beyond the Kyoto Protocol's first commitment period. Until very recently, there was a significant amount of uncertainty as to whether the Kyoto Protocol would be continued beyond its first commitment period (i.e. 2012). CER purchasers have therefore

been reluctant to make binding commitments to purchase CERs post-2012, such that the financial incentive created by CERs has in many cases been insufficient to support renewable energy projects for their entire operational life.

- As a result, many renewable energy projects which may be eligible under the CDM have had difficulty attracting project finance to support the projects. CER purchasers have tended to restrict their involvement in CDM projects to a commitment to pay for CERs upon delivery, rather than provide financial support for the underlying project. Registration as a CDM project does not necessarily mean that a renewable energy project will achieve project finance and become operational. Issues such as perceived regulatory and political risk in developing countries and the higher level of technology risk involved in renewable energy projects (as opposed, for example, to traditional fossil fuel projects) have meant that those renewable energy projects which have achieved external finance have tended to be smaller scale projects, rather than projects to create the optimum number of CERs. In addition, local host country regulations (such as grid connection, distribution or electricity tariff arrangements) may not provide renewable energy projects with the priority or support needed to make them feasible in the existing electricity market.
- Therefore, the transaction costs of developing these smaller scale projects as CDM projects (including the costs of external auditors, registration fees, consultants' fees and legal fees for the negotiation of CER purchase agreements and power purchase agreements) may be prohibitively high compared to the volume of CERs expected to be generated by the projects.
- Finally, there have been a number of "bottlenecks" and inefficiencies during the CDM project approval process, which have affected renewable energy projects amongst others. The CDM Executive Board (a number of part-time, unpaid government officials) has been stretched to capacity, and resources at the UNFCCC Secretariat have been insufficient to efficiently deal with the volume of CDM projects proposed. Because many renewable energy project developers can not attract project finance until their project has achieved registration as a CDM project, delays at the Executive Board level have also delayed the rate at which renewable energy projects are actually commissioned.

Part III: Steps Already Taken to Address the Barriers

A number of important steps have already been taken which should mitigate some of the barriers discussed above. For example:

- The parties to the Kyoto Protocol agreed in Montreal in December 2005 to continue the Kyoto Protocol for a second commitment period, and to negotiate binding emission reduction targets for developed country parties. This should significantly reduce the uncertainty for CER purchasers and investors in potential CDM projects on whether CERs will have some value after 2012.

- A number of developing countries (such as China and Malaysia), when approving CDM projects, have given formal priority to projects which have a definite contribution to sustainable development in the country, including renewable energy projects. In addition, some CER purchasers, such as the Dutch and Austrian governments, have excluded projects without direct sustainable development benefits (such as HFC23 projects) from their portfolio criteria, or are prepared to pay a premium CER price for CERs from renewable energy projects. Such measures give renewable energy projects a comparative advantage against other types of CDM projects which may be able to create larger volumes of CERs for less investment.
- Many developing countries have realized that to attract the levels of investment in renewables required to achieve sustainable development, a local regulatory framework in *addition* to the CDM that encourages the implementation of renewable energy projects (such as through renewable energy targets or preferential feed-in tariffs) is essential. For example, China and India have implemented local regulations providing preferential treatment to renewable energy projects. The CDM Executive Board has recognized that such regulations should not affect a project's eligibility under the CDM (i.e. that developing countries should not be "penalized" in terms of CDM investment because they implement laws and regulations designed to reduce emissions).
- The CDM rules now explicitly allow the "bundling" of projects to reduce transaction costs, including even the bundling of a number of large scale renewable energy projects. In addition, the parties to the Kyoto Protocol have agreed that renewable energy projects which are implemented as part of a government policy or "programme of activities" (e.g. the installation of solar lighting in a community or the financing of a number of biomass plants in rural areas) are eligible under the CDM. This additional flexibility in the CDM rules should both reduce transaction costs for renewable energy projects, and also enable some smaller scale projects which would not otherwise be feasible to be recognized under the CDM.
- Finally, the COP/MOP at Montreal approved a number of measures that should go some way towards addressing the resources and capacity difficulties experienced in the early years of the CDM.

Part IV: Further Opportunities to Improve the Performance of Renewable Energy Projects under the CDM

However, notwithstanding the positive recent developments and alterations to the CDM rules discussed above, there are a number of opportunities to further improve the performance of renewable energy projects under the CDM by utilizing the existing rules. The opportunities discussed by this paper are:

- the development of a number of pilot renewable energy projects under the "programmatic CDM" guidance and the development of bundled renewable energy projects;

- how domestic CDM policies that implement CDM architecture and processes in host countries can be further enhanced to give priority to renewable energy projects;
- ensuring national regulations to promote renewables are complementary to the purpose of the CDM and that the necessary information to determine CDM project baselines (which, according to CDM Executive Board guidance must be a hypothetical scenario *without* the regulations) is publicly available for future project developers; and
- developing further opportunities for renewable energy project finance, both from CER purchasers (for example, through upfront payments, debt provision or equity investment) and also from external sources (such as China's Clean Development Fund or from traditional financiers such as the World Bank, the Asian and African Development Banks and from local financial institutions).

Finally, countries should consider how the CDM rules themselves could be amended to give special consideration to renewable energy projects and allow them to compete on a more level playing field for CDM investment.

Part V: Conclusions

Last year, the first year of the Kyoto Protocol's entry into force, saw a marked increase in the number of renewable energy projects registered under the CDM and also the identification of a number of inadequacies and inefficiencies in the CDM rules and market practice. Many of these inadequacies and inefficiencies are being addressed through amendments to the CDM rules, national regulations or market practice.

However, this year and next will determine the extent to which the modifications to such rules, regulations and market practice result in a significant increase in the number of commissioned renewable energy projects in developing countries. If there is such an increase, this will assist not only to enable developed countries to meet their Kyoto Protocol targets and reduce global greenhouse emissions, but will also contribute towards sustainable development in key developing country economies.

Part I: Introduction to the CDM

The Clean Development Mechanism (**CDM**) under the Kyoto Protocol to the United Nations Framework Convention on Climate Change (**UNFCCC**) has the potential to be an effective tool in international law to encourage investment in renewable energy projects in developing countries.

The international legal framework for the CDM consists of the UNFCCC Article 12 of the Kyoto Protocol (**KP**) and the Marrakech Accords (**MA**). These international legal instruments, along with any rules developed by the CDM Executive Board (**EB**), decisions of successive Conferences of the Parties¹ and domestic host country requirements, provide the legal regime within which CDM projects are developed.²

Under the broader framework of the Kyoto Protocol, industrialized country parties to the Kyoto Protocol (**Annex I Parties**) agreed to binding emission reduction targets to be achieved during the first Kyoto Protocol commitment period (from 2008-2012). Developing countries have not undertaken binding emission reduction targets. However, as the climate change mitigation benefit of an emission reduction project is equal no matter where in the world that project is undertaken, it makes sense to allow emission reduction activities in developing countries to be counted towards achieving the overall Kyoto Protocol targets, thereby both:

- encouraging sustainable development and technology transfer in developing countries, some of which (e.g. China and India) are rapidly becoming major global economies; and
- allowing Annex I Parties to achieve their mitigation targets at least overall cost.

These ambitions constitute the primary purpose of the CDM.

The current form of the CDM, based on Article 12 of the Kyoto Protocol to the UNFCCC, emerged late in the negotiations at the third Conference of Parties to the UNFCCC from the proposal by Brazil for a "Clean Development Fund", whereby contributions from Annex I Parties would be utilized towards financing emission reduction projects in developing countries. Through the subsequent four years of negotiations, this concept metamorphosised into the current CDM, which allows projects in developing countries to create credits (**Certified Emission Reductions** or **CERs**) which can be purchased and utilized by Annex I Parties to meet their Kyoto Protocol emission reduction obligations.

The original vision of the CDM involved Annex I Parties or private entities from those countries actually financing and investing in emission reduction projects in developing countries in return for CERs from those projects. However, in practice, Annex I Parties and private entities have tended to avoid actually providing debt or equity to CDM projects – preferring instead simply to purchase CERs from such

¹ For example, the Land-Use, Land-Use Change and Forestry guidance issued at COP9.

² These rules can be accessed from the UNFCCC web site at <http://unfccc.int>.

projects on delivery and leaving it to the local project developers to actually source project finance.³ The difficulties that this trend has caused for renewable energy projects are discussed further in Part II.

One of the primary aims of CDM is to encourage sustainable development in non-industrialised countries. For such countries virtually without exception, providing their populations with access to electricity is a primary development objective. In order to have any chance of avoiding the predicted dangerous effects of human-induced climate change, it is essential that a large part of the demand for electricity in developing countries is met with renewable energy supply.

Renewable energy should therefore be a key component of any global climate change strategy, and should be an important focus of the CDM.

³ See, for example, UNEP Finance Initiative CEO Briefing January 2005: "Finance for Carbon Solutions", available at <http://www.unepfi.org>

Part II: Barriers for Renewables under the CDM

This part identifies a number of hurdles to the operation of the CDM, which renewable energy projects must overcome if the CDM is to assist significant market penetration of renewables in the global energy mix.

Relatively High Equipment Cost and Low CER Return

During the Kyoto Protocol negotiations, a range of NGOs and stakeholders suggested that eligibility under the CDM should be restricted to an exclusive positive list of renewables and demand-side energy efficiency technologies.⁴ Their argument was that such projects should be "deemed" to comply with the CDM eligibility criteria (i.e. additionality), or at least that such criteria should be less strict in respect of such projects. Ultimately, the "positive list" approach was not adopted by the Kyoto Protocol parties. Rather, any project which reduces emissions can be eligible under the CDM, provided that it meets certain criteria.

This has meant that renewable energy projects have needed to "compete" for CDM investment with projects that create much larger volumes of emission reductions (and therefore CERs), for a smaller project investment.⁵ For example, a 50MW wind farm in India (a large scale wind farm, compared to the size of most wind farms which have been successful in attracting project finance, due to perceived technology risk) is estimated to cost around US\$58 million to develop and create around 112,500 CERs per year.⁶ On the other hand, two HCFC22 plants in China, from which the World Bank's Umbrella Carbon Fund purchased HFC23-based CERs in December 2005, is expected to generate *19 million* CERs per year.⁷ HFC23 destruction technology is generally much less cost-intensive than wind farm turbines.

As indicated by the graph below (which is based on the information publicly available on the CDM web site), a number of renewable energy projects have successfully navigated the CDM project cycle to achieve registration. In fact, in January 2006, the majority of registered CDM projects were projects involving the generation of renewable energy.

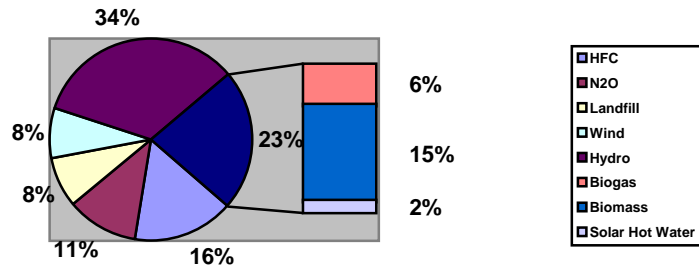
⁴ See, for example, the Climate Action Network's CAN Climate Negotiations Newsletter Eco 4 – June 12, 2000: http://www.climatenetwork.org/eco/sb/sb12/eco4_0600.html

⁵ See, for example, Hanh, Michealowa and de Jong, "From GHGs Abatement Potential to Viable CDM Projects", Hamburg Institute of Economics, HWA Report 259, 2006

⁶ Senergy Global Pvt Ltd. "Unilateral CDM Project: Project Developer's perspective and Financial Structuring", presentation by Chintan Shah

⁷ see <http://www/carbonfinance.org>, "A big step for Chinese emissions trading"

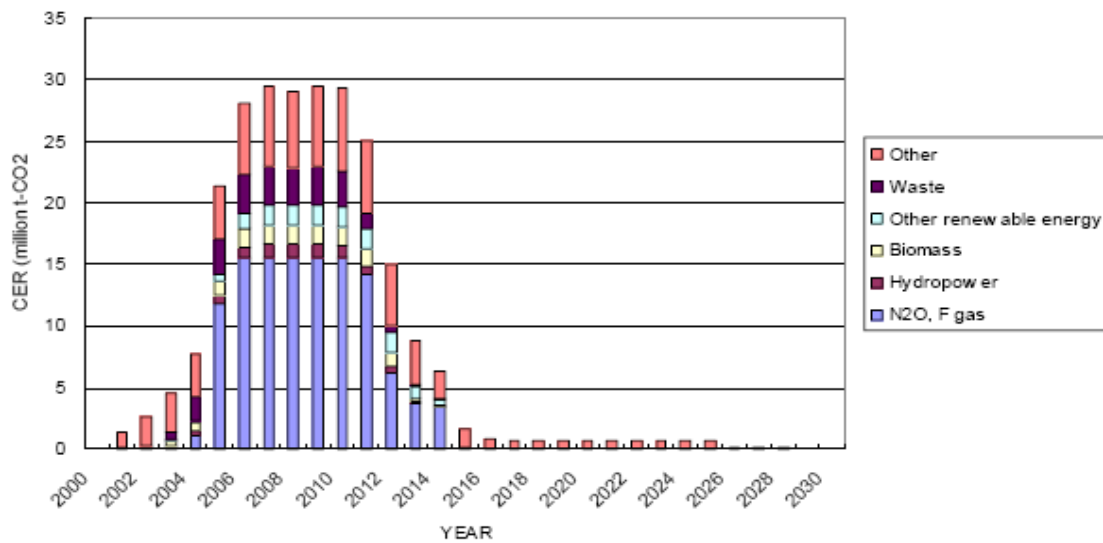
Registered CDM Project Type:
January 2006



However, as a result of the relatively "small" global warming potential of carbon dioxide compared to other greenhouse gases and the high equipment cost of renewables, the increase in IRR from the sale of CERs from a CO₂-based renewable energy project (estimated at around 1%, assuming a US\$6 CER price)⁸ is significantly less than the increase in IRR from a project involving other greenhouse gases (such as landfill methane capture).

The significant majority of CERs from registered projects (estimated on the basis of public project design documents) will in fact come from the smaller number of HFC and N₂O projects.

Forecast CERs accrued from submitted CDM Project (by Project Type)⁹



As the CDM is at its essence a market, the high volumes of CERs which can be created by industrial chemical projects (such as HFC₂₃ and N₂O reduction projects) will directly impact the market price of CERs. There is no legal distinction between CERs created from renewable energy projects or from industrial chemical projects, so renewable energy projects are at a comparative disadvantage to other types of potential large-scale CDM projects.

⁸ "CDM in the Post Kyoto Regime: Incentive Mechanisms for developing countries to promote energy conservation and renewable energies" Workshop Issue Paper March 22 and 23, 2005, Taishi Sigiya, Kenichiro Yamaguchi and Hiroshi Yamagata.

⁹ Ibid note 5 – original source, Mitsubishi Research Institute

The international community has specifically refrained from differentiating renewable energy projects from other types of emission reduction projects under the CDM rules. Therefore, it will be CDM host countries which will bear the responsibility of addressing this comparative disadvantage, through, for example, the CDM approval process and through implementing local regulations to encourage renewables.

Insufficient Regulatory Certainty to Guarantee CER Revenue Stream for the Operational Life of Renewable Energy Projects

Renewable energy projects such as hydropower and wind projects often have a significant economic lifespan (between 20 and 30 years).¹⁰ The first commitment period of the Kyoto Protocol (which is the purpose for which CERs are currently being purchased by developed countries and companies) expires in 2012.

Therefore, a renewable energy project which has just achieved CDM registration and is currently being constructed (expected to be commissioned in 2007) will have an economic life of up to 25 years longer than the period for which CER purchasers are currently purchasing. Most CER purchasers are reluctant to commit to binding obligations post-2012. However, if a renewable energy project has obtained registration on the basis of an "investment barriers" analysis¹¹, then this may mean that the small IRR increase from the sale of CERs (e.g. 1%) is the only element which makes the project financially feasible and pushes the project over the investment criteria threshold.

If it seemed likely that this additional 1% CER revenue would only be available for the first five years of the project's life, project developers may consider that this is not enough certainty on which to base the significant financial outlay to construct the project.

The issue of the future market value of CERs (and indeed, whether or not a second Kyoto Protocol commitment period is agreed) is largely dependent on international politics, including whether Russia chooses to release its AAUs to the market, and whether Kyoto Protocol parties such as the European Union, Japan and Canada are able to agree on binding emission reduction targets. However, the December 2005 meeting of parties to the Kyoto Protocol provided greater certainty that the CDM will continue beyond 2012, as discussed in the following part.

Local host country regulations (and regulatory uncertainty) will also be crucial to the feasibility of a renewable energy CDM project. If a host country has implemented long term regulations to encourage renewable energy projects, which are expected to continue for the economic life of renewable energy projects being built today, this will have a greater effect on the investment analysis of a project than the international politics surrounding the Kyoto Protocol. Conversely, if local regulations present barriers to renewable energy projects, such as an inability to obtain grid access or

¹⁰ See, for example, "Hydroelectric Power in Hawaii, a Reconnaissance Survey" 1981 available at <http://www.state.hi.us/dbedt/ert/hydropower-81.html>

¹¹ One of the means of proving additionality, according to the Executive Board's "Tool for the Demonstration and Assessment of Additionality" available at <http://cdm.unfccc.int/>

environmental approvals, this will essentially prohibit the growth of the renewable energy industry in that region. As discussed further below, domestic regulations encouraging renewable energy projects do not, under the international rules, impact on the additionality analysis of a CDM project. Therefore, domestic regulations to encourage the CDM may in fact enable renewable energy projects to overcome many of the barriers identified in this paper, by providing a comparative advantage to renewable energy projects in certain countries or regions without affecting their eligibility to access credits under the CDM.

Difficulty Attracting Project Finance

Although the initial concept of the CDM envisioned developed countries providing technology transfer to developing countries (and therefore taking some type of debt or equity investment), until recently CER purchasers, even where those purchasers are financial institutions, have largely tended to limit their involvement in the project to being an offtaker of CERs, with payment to be made upon delivery, rather than providing project finance or becoming an equity participant in the project. This has been due to a number of reasons, including the concern that the Kyoto Protocol may not enter into force and the issue of political and regulatory risk in the CDM host country. In addition, with renewable energy projects in particular, some types of renewables carry a perceived technological risk, which may make investors cautious to support these projects compared to more "basic" CDM projects such as gas flaring.

As a result, it has largely been up to local project developers to initially finance their projects off the books or to seek traditional project finance from local banks and investors. Many renewable energy projects which have signed CER purchase agreements and/or achieved registration as CDM projects have in fact been unable to achieve financial close.¹²

Traditionally, most renewable energy projects are developed or financed by the private sector. It is only when the private sector has sufficient incentive to invest in renewables that renewable energy technology will achieve the depth of energy market penetration necessary to reverse the global trend of rising emissions.

In countries where access to fossil fuels is cheap and plentiful, the success of encouraging private sector investment to certain types of renewable energy projects (such as solar and wind) is almost entirely dependent on national or regional renewable energy policy and regulation. However, by creating an additional "commodity" for renewable energy projects in terms of CERs (and thereby an additional revenue stream for the project), the CDM creates an additional financial incentive for renewable projects in *any* developing country party to the Kyoto Protocol. The value of CERs is not contingent on the location of the relevant CDM project, so therefore the comparative advantage of CDM projects in different countries is based on local regulations and political and regulatory risk considerations.

¹² See, for example, "Financing Renewable Energy in Emerging Markets – Opportunities and Approaches", Frank Joshua, Climate Investment Partnership, presentation to Workshop on Innovative Options for Promotion and Transfer of Technologies, Montreal, December 2004

As an instrument of international law, the Kyoto Protocol operates only to create legal obligations for nation states (and not for individuals or private entities). However, to achieve sufficient volumes of abatement without significant government subsidies requires substantial involvement of the private sector.

The CDM therefore explicitly allows Kyoto Protocol parties to approve participation of public and/or private sector entities in CDM projects. In fact, the majority of registered CDM projects to date have been largely private sector-driven. Almost all developing countries have encouraged the involvement of the private sector in CDM projects, with only a few countries (e.g. China) placing limits on the identity and nature of entities eligible to create and sell CERs. However, unless there is sufficient local regulatory support for renewable energy projects to support private sector financing of such projects, the CDM alone is unlikely to create a significant and robust renewable energy market.

High Transaction Costs

Obtaining registration as a CDM project and verification of CERs can involve significant transaction costs, including the commissioning of consultants and lawyers, the payment of auditors (*Designated Operational Entities*) and the payment to the Executive Board of a fee upon registration and issuance of CERs.

Although some effort has been made by the parties to the Kyoto Protocol to reduce costs for small scale projects, economies of scale generally mean that costs (other than Executive Board fees) do not significantly increase as the volume of CERs increases, so renewable energy projects expected to generate a relatively small number of CERs may find the CDM transaction costs prohibitive.

For example, EcoSecurities has estimated that the consultancy costs for project assessment and completion of the project documentation necessary to register a large scale (i.e. >15 MW) renewable energy project range between £23,000 and £122,000,¹³ plus additional fees for the Designated Operational Entity's validation and verification. The Executive Board will also require payment of US\$21,000 upon registration of such a project to cover administrative expenses, plus US\$0.20 per CER issued (with a discount of US\$0.10 for the first 15,000 CERs issued each year). For a 50MW renewable energy plant expected to produce around 112,500 CERs per year, the transaction costs can eat away much of the first year's expected CER revenues from the project.

Bottlenecks and Inefficiencies in the CDM Project Cycle

The first year of CDM operation saw the Executive Board and the UNFCCC secretariat stretched beyond capacity, endeavouring to deal with an ever-growing number of proposed projects and methodologies on an extremely limited budget.

¹³ See UK Climate Change Projects Office Guide "Carbon Transaction Costs and Carbon Project Viability"

Some market participants have claimed that bottlenecks and administrative inefficiencies have arisen in the following contexts:

- irregularity of EB meetings;
- delays in, and inconsistency surrounding, approval of methodologies;
- registration of projects and a disproportionate number of requests for review;
- the Executive Board's stringent interpretation of "additionality", requiring project developers to prove that they had always intended to implement the project as a CDM project;
- failing to streamline the approval processes for small-scale projects;
- delays in the establishment of the International Transaction Log (which will enable emissions trading of CERs).¹⁴

Whilst it is beyond the scope of this paper to deal with any of these issues in great detail, it is worth noting that any emerging market experiences "growing pains" in its first few years of operation, and that many of the perceived inefficiencies or difficulties with the operation of the CDM are likely to be mitigated as all stakeholders gain greater experience in the project cycle, and precedents are developed to look to when difficulties arise.

¹⁴ See, for example, "Strengthening the CDM", IETA position paper for COP/MOP1, available at <http://www.ieta.org/ieta/www/pages/getfile.php?docID=1132>

Part III: Steps Already Taken to Address the Barriers

A number of important measures have already been taken by the international community, CER purchasers and CDM host countries, to address and mitigate the barriers described in the previous part. These are discussed below.

Continuation of the Kyoto Protocol

The parties to the Kyoto Protocol agreed in Montreal in December 2005 to continue the Kyoto Protocol for a second commitment period, and to negotiate binding emission reduction targets for developed country parties during such period. This should provide some much needed certainty for CER purchasers and investors in potential CDM projects that CERs will have some value after 2012.

Preferential Treatment of Renewable Energy Projects in the CDM Approval Process and the Purchase of CERs

As discussed previously, the CDM is essentially a compliance market, and in the absence of government intervention or buyer preference, capital investment will tend to focus around projects where CER creation is cheapest and most plentiful (being industrial gas projects such as HFC and N₂O projects).

However, host country governments have sole discretion to influence the conditions on which they will approve certain types of CDM projects, as it is a prerequisite to registration of a CDM project that the project has been approved by the host country as contributing towards "sustainable development". As discussed below, most host countries have identified renewable energy as a key contributor towards sustainable development. On the other hand, industrial gas projects such as HFC₂₃ abatement projects, provide limited or no local environmental or social benefits in the host country.

A number of developing countries (such as China and Malaysia), when approving CDM projects, have given formal priority to projects which have a definite contribution to sustainable development in the country, including renewable energy projects.

In addition, some CER purchasers, such as the Dutch and Austrian governments, have excluded projects without direct sustainable development benefits (such as HFC₂₃ projects) from their portfolio criteria, or are prepared to pay a premium CER price for CERs from renewable energy projects.

Such measures attempt to put renewable energy on a more level playing field with other types of CDM projects which may be able to create larger volumes of CERs for less investment.

Local Regulation Supporting Renewable Energy Projects

The CDM is designed to encourage the dual goals of global reduction in emissions and sustainable development for developing countries. Renewable energy could be one of the major contributors to sustainable development, reducing developing country reliance on (often expensive and imported) fossil fuels such as coal, oil and diesel, whilst also assisting to meet the growing energy demand.

The Kyoto Protocol recognises the importance of renewable energy as a contributor to the mitigation of climate change, providing in Article 10 that:

all Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances...shall...formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change...[including] the energy, transport and industry sectors...

Although renewable energy is not specifically mentioned in the CDM, many developing countries have made it a cornerstone of their national and regional development priorities. China and India, two developing economies expected to grow exponentially over the next decade, have developed a range of policies and procedures to integrate renewable energy into the mainstream energy mix.

For example, Chinese President Hu Jintao stated late last year:

China attaches great importance to the utilization and development of renewable energy and considers it as one of the most important instruments to promote socio-economic development.¹⁵

China's Vice-Premier Zeng Peiyan elaborated:

Chinese government has attached great importance to the development and utilization of renewable energy, listing it as an important task to fasten the development of renewable energy including wind, solar, biomass and others during the period of the Eleventh Five-Year Plan. Therefore, we will take series of measures to develop and utilize renewable energy vigorously. First of all, specific development goals will be set. By 2020, the renewable energy is planned to take 15% of the total energy supply.¹⁶

India has also recognized the importance of renewable energy in achieving sustainable development. In his 2005 Independence Day address to the nation, India's President stated:

Energy is the lifeline of modern societies. But today, India has 17% of the world's population, and just 0.8% of the world's known oil and natural gas resources. We might expand the use of our coal reserves for some time and that too at a cost and with environmental challenges. The climate of the globe as a whole is changing. Our water resources are also diminishing at a faster rate. As it is said, energy and water

¹⁵ Letter from President Hu Jintao to the Beijing International Renewable Energy Conference 2005, dated 6 November 2005.

¹⁶ Keynote address to the Beijing International Renewable Energy Conference 2005, 7 November 2005

demand will soon surely be a defining characteristic of our people's life in the 21st Century...

... It would be evident that for true Energy Independence, a major shift in the structure of energy sources from fossil to renewable energy sources is mandated.

Many other developing countries, as well as China and India, have recognized that the CDM alone is insufficient to create enough incentive for the volumes of renewable energy projects required to significantly change the energy mix in the manner necessary to avoid unsustainable long-term reliance on fossil fuels. National and regional renewable energy regulation is also a necessary part of the policy mix.

Many developing countries have begun to develop renewable energy policies to encourage renewable energy projects, including:

- feed-in tariffs;
- market-based renewable energy instruments;
- renewable energy targets;
- tax incentives; and
- government financial support.

A comparative analysis of various national renewables regulations is beyond the scope of this paper.¹⁷ However, it is important to develop procedures and international regulations to ensure that developing countries which implement national regulations to support renewables and encourage sustainable development are not disadvantaging their prospects of attracting CDM investment by negating the "additionality" of renewable energy projects. National renewables policies and regulation should be complementary to, not inconsistent with, the CDM.

Aligning National Regulations with the CDM Additionality Requirements

One of the key criteria under the international rules for eligibility under the CDM is "additionality". Before a CDM project can be registered as eligible to create CERs, it must first prove that the project will reduce emissions below the projected emissions in the most likely scenario without the project (the ***Baseline***). A CDM project activity must generate emission reductions that are "additional" to those which would have occurred in the absence of the project activity (the ***Additionality*** requirement).

Only once the Executive Board has accepted the Baseline for the project and is satisfied that the project fulfils the Additionality criteria will the project be eligible to generate CERs, which are measured and verified by independent auditors in accordance with agreed standards and criteria under the international rules. Each CER represents one tonne of carbon dioxide equivalent abated by a project activity below the approved Baseline.

¹⁷ However, we note that the CCLaw Assist project, sponsored by the UK Foreign and Commonwealth Office and conducted by Baker & McKenzie and Institute of Development Studies is in the process of creating a guidebook which will compare and contrast the national regulations in the five key CDM jurisdictions of Brazil, China, India, Mexico and South Africa.

The requirement to prove Additionality, and the procedure for doing so, has been a contentious aspect of the CDM.¹⁸ The "additionality tool" created by the CDM Executive Board, specifically requires project developers to prove that registration of a project (including a renewables project) under the CDM would allow the project to overcome barriers which would otherwise prevented the project, such as:

- financial barriers to investment (i.e. the CER revenues will allow the project to attract investment, based on expected rate of return)
- technological barriers (i.e. limited local skills or knowledge on the operation of the technology, reluctance of banks to provide debt funding to perceived "risky" technologies)
- barriers due to prevailing practice (i.e. the project is the "first of its kind" in the host country)¹⁹

On the basis of this assessment (considered in further detail below), the CDM will allow renewable energy projects to occur which are "additional" to those which would have occurred in developing countries in a business-as-usual scenario. That is, the effect of the CDM should be to increase investment in renewables over and above the investment which would have otherwise occurred.

However, there was initially some hesitation by developing countries when considering whether to implement regulation or policy designed to encourage renewables could in fact "jeopardize" the ability of renewable projects in those countries to become CDM projects. For example, the argument was made that, if China implemented a preferential feed-in tariff for renewable energy projects (as is envisioned by China's Renewable Energy Law), then this would mean that renewable energy projects would become comparatively more financially attractive, and therefore may have difficulty passing the "additionality" test established by the CDM Executive Board.

There was a concern that this could create a perverse incentive for developing countries, in that they may be reluctant to pass laws or policies encouraging emission reductions for the fear that such laws may negate the additionality of future projects, and thereby reduce foreign investment and technology transfer into the country.²⁰

Such a result would obviously be politically undesirable. The CDM Executive Board has recognized this potential disincentive and addressed it at its 16th meeting, in a decision titled "*Clarifications on the treatment of national and/or sectoral policies and regulations (paragraph 45(e) of the CDM Modalities and Procedures)*" in

¹⁸ Ibid note 12.

¹⁹ See Annex 8 to the Executive Board's 22nd meeting in Montreal, December 2005 http://cdm.unfccc.int/EB/Meetings/022/eb22_repan8.pdf

²⁰ For example, see the presentation by Berliner Energieagentur GmbH to the Conference on Financing Renewable Energy in China, May 2005 http://www.erec-renewables.org/documents/China/presentationsBrussels/MB_SYNERGY_EU_China_partnership_project.pdf

determining a baseline scenario".²¹ It subsequently provided further guidance at its 22nd meeting in Montreal, Canada.²²

The Executive Board has provided that, as a general principle, national and/or sectoral policies and circumstances are to be taken into account on the establishment of a baseline scenario, without creating perverse incentives that may impact host countries' contributions to the ultimate objective of the climate change convention.

The Executive Board agreed to differentiate ways to address the following two types of national and/or sectoral policies in determining a baseline scenario²³ (i.e. assessing the eligibility of a project and its "additionality" under the CDM rules:

- Existing national and/or sectoral policies or regulations that create policy driven market distortions which give comparative advantages to *more* emissions-intensive technologies or fuels over less emissions-intensive technologies or fuels (e.g. national fossil fuel subsidies) (type "E+").
- National and/or sectoral policies or regulations that give positive comparative advantages to *less* emissions-intensive technologies over more emissions-intensive technologies (e.g. public subsidies to promote the diffusion of renewable energy or to finance energy efficiency programs) ("type "E-").

The Board determined that only type E+ policies (i.e. policies which encourage more emissions-intensive technologies) implemented *before* the adoption of the Kyoto Protocol shall be taken into account when developing a baseline scenario. If these policies were implemented since the adoption of the Kyoto Protocol in 1997, the baseline scenario should refer to a hypothetical situation without the relevant national and/or sectoral policies or regulations being in place.

For type E- policies (i.e. policies which encourage *less* emissions-intensive technologies), any such policies which have been implemented since the adoption of the Marrakech Accords (November 2001) need not be taken into account in developing a baseline scenario (i.e. the baseline scenario could refer to a hypothetical situation without the national and/or sectoral policies or regulations being in place).

The renewable energy laws and policies being implemented by the Chinese and Indian governments would be considered "Type E-" for the purpose of the Executive Board's decision, so would not need to be taken into account when developing a baseline.

As discussed above, the dissemination of renewables in developing countries (one of the key desired outcomes of the Renewable Energy and International Law Project) is

²¹ <http://cdm.unfccc.int/EB/Meetings/016/eb16repan3.pdf>

²² http://cdm.unfccc.int/EB/Meetings/022/eb22_repan3.pdf

²³ "National and/or sectoral policies" are defined as: (1) Policies and regulations decided and published by local and/or national authorities of the host Party(ies), or (2) Policy driven market distortions resulting from decisions taken by local or national public authorities of the host Party(ies).

likely to require local laws and policies in developing countries to support renewables over and above the incentives provided by the CDM. It is important, therefore, that such local laws and policies do not negate the ability of a project to qualify under the CDM. The CDM Executive Board has provided that this should not be the case.

Use of CDM Projects to Support Sustainable Development Goals

Under the Marrakech Accords, the goal of sustainable development is mandatory for CDM projects. However, it is left up to individual DNAs to determine the sustainable development criteria and to approve or deny projects based on those criteria. This has been challenging as some of the easiest projects to implement with the largest volumes of CERs, such as HFC-23 projects, arguably offer few local development benefits to host countries. In addition, the low cost and high yield of HFC-23 projects renders them relatively more attractive to CDM investors than renewable energy projects, placing the latter at a comparative disadvantage in terms of attracting investment. This outcome is clearly undesirable from a sustainable development perspective.

One innovative way to approach this problem is to create a domestic regulatory environment in which the sale of CERs from projects with lower development benefits are taxed at a higher rate than those with larger benefits. The revenue created can then be invested in a fund that would be used to advance sustainable development goals.

A system like this is currently in place in China, where the proceeds from CER sales from HFC-23 projects are taxed at 65%, N₂O are taxed at 30% and priority projects (including renewables) and others are taxed at 2%. In addition to creating revenue for sustainable development, this tax structure displaces the comparative disadvantage of renewable energy projects, which are in themselves preferable to HFC-23 projects in terms of meeting the host country's sustainable development goals.

Given that renewable energy is high on China's list of sustainable development priorities, and that two HFC23 projects in China *alone* created US\$930 million of CER revenues (i.e. US\$604.5 million in taxes)²⁴, the amount generated into this fund is expected to be significant. To put the level of this fund in perspective, *global* investment in renewable energy in 2004 was estimated at a record level of US\$30 billion.²⁵ If the Chinese government invested the CDM tax on the two HFC23 projects in renewable energy projects, this would constitute around 2% of the global annual investment for renewable energy. There is therefore a tremendous opportunity for China to provide financial support to renewable energy projects through its sustainable development/CDM fund, and potentially for the global renewable energy industry to influence the investment priorities of the fund, which is currently being established.

²⁴ See "Big Chinese Step in Carbon Emissions Trading": HFC23 project combines major carbon emission reductions and sustainable development benefits: World Bank press release 2006/224/ESSD

²⁵ See "Renewables 2005 Status Report" published by the Renewable Energy Policy Network for the 21st Century (REN21) and available at www.ren21.net.

Bundling of Projects and Programmatic CDM

The decisions taken at COP/MOP1 Montreal formally recognized that

a local, regional, national policy or standard can not be considered as a clean development mechanism project activity, but that project activities under a programme of activities can be registered as a single clean development mechanism project activity.²⁶

The inclusion of "programmatic CDM" activities creates a valuable opportunity for a whole range of renewable energy projects, including those smaller scale and micro-projects (such as the installation of PV solar panels in residential housing) which would not otherwise generate the volume of CERs necessary to make the CDM transaction costs worthwhile.

In addition, the programmatic CDM provides important incentive for developing countries to pursue local, regional or national policies and measures in the renewable energy field.²⁷

A CDM program is one in which emission reductions are achieved by multiple activities executed over time as a result of a government measure or private sector initiative. Generally, a CDM program would have the following characteristics:

- it occurs as the result of a deliberate public sector measure (voluntary or mandatory) or a private sector initiative; and
- it results in a multitude of dispersed activities (potentially over a number of time periods and locations) that would not occur but for the implementation of the program.

The CDM rules would require the program of activities to be submitted as a single project activity (e.g. conversion of local diesel generators in remote communities in Eastern China to biomass generators), through the submission of a single project design document.

As of the date of this paper, there are a number of "programmatic CDM" activities that have achieved registration. For example, the World Bank's Community Development Carbon Fund has purchased CERs from a registered CDM project in Moldova which involved the implementation of renewable energy projects and fossil fuel switching to biomass in 120 public, residential and commercial buildings in Moldova.²⁸ The project involved three separate Baseline methodologies for the different types of activities being implemented under the program. The project is expected to create 17,888 CERs per annum.

In addition to programmatic CDM, the CDM rules also allow the "bundling" of similar projects in the one registration process, to minimize transaction costs. Even

²⁶ Further Guidance Relating to the CDM, paragraph 20.

²⁷ See "Policies and Programs under the CDM", presented by Christiana Figueres at COP/MOP1.

²⁸ See <http://cdm.unfccc.int/Projects/DNV-CUK1133985755.59/view.html>

large scale projects can be bundled. Bundling can create an opportunity for renewable energy project developers with a portfolio of projects in the same country to minimize the CER transaction costs involved in developing each project individually as a CDM project.

Addressing Resources Issues of the CDM Executive Board and Secretariat

A number of important steps were taken in Montreal to assist in remedying the difficulties experienced in the CDM project cycle due to the sparse resources allocated to the Executive Board and UNFCCC secretariat.

Specifically, Executive Board members will receive per diem remuneration for their services provided and the UNFCCC secretariat will be significantly bolstered to provide administrative support to the Executive Board, with the Executive Board taking on more of an "executive" oversight role. Annex I country financial support is expected to be forthcoming to assist the streamlining of the CDM project cycle. In addition, the COP/MOP approved a share of proceeds for administration of the CDM, being US\$0.20 per CER issued, with the first years' payment in advance.²⁹ As more CERs are issued, this should assist to ease the pressure on resources at the secretariat and Executive Board level, and hopefully remedy some of the "bottlenecks" that have arisen in the CDM project cycle.

²⁹ with a discount of US\$0.10 for the first 15,000 CERs issued each year.

Part IV: Further Opportunities to Improve the Performance of Renewable Energy Projects under the CDM

As discussed in the previous part, significant progress has been made over the past year in terms of addressing barriers and creating opportunities for renewables under the CDM. However, there is room for further improvement and action which will further increase the capacity of renewables to contribute to the CDM. Some of the primary opportunities are discussed below. However, during the course of this year, as some of the modifications to the CDM rules and national regulation to support renewables are implemented in practice, it is likely that further opportunities will be identified.

Further Development of Programmatic CDM Projects

As discussed above, the CDM rules have been clarified to expressly allow programmatic CDM projects. This creates an important opportunity for renewable energy policies and programs to be recognized under the CDM. In particular, programmatic CDM may create opportunities for micro-renewables (such as community PV projects) to generate CERs and attract carbon finance. However, the development of such projects would require significant coordination in terms of tracking the implementation of the program and the number of emission reductions achieved. In addition, the Baseline for a programmatic CDM project may involve a number of project methodologies.

Organisations with the capacity to effectively implement programmatic CDM, such as local governments, may not be aware of the opportunities created for them under the CDM, nor may they have the technical capacity to develop effective Baselines without consulting with experts. There is therefore an opportunity to build the capacity of local and regional governments (for example, the local and regional governments in China charged with developing renewable energy policies under China's National Renewable Energy Law) to recognize the opportunities for programmatic CDM to assist them to generate additional revenue, which could be used to finance the costs of the project.

Use of Domestic Policy and Regulation to Prioritise Renewable Energy Projects

Domestic policy and regulation that makes up the CDM architecture of a host country government can be crucial in determining investment priorities for CDM projects. Initiatives may be either market-based or legal; restrictive ("pull") or incentive-based ("push"). For example, countries may implement mandatory targets which oblige a certain percentage of approved CDM projects to be renewable energy related. Alternatively, host countries may offer grants, subsidies or tax incentives to renewable energy projects to encourage their implementation in the place of other projects with low development benefits. China's original tax-based approach to this issue was discussed above, but several other domestic programs and incentives could be effective.

Gathering Public Information on Baselines without "E+" Regulations

As discussed above, the CDM Executive Board has provided that national or regional regulations with the effect of favouring projects which reduce emissions (including, for example, China's Renewable Energy Law), should *not* be taken into account when developing a project Baseline (i.e. they should not impact Additionality). It is perhaps, however, easier said than done to calculate a project baseline in a "hypothetical scenario" without certain laws or policies ever having entered into effect.

The current CDM rules require each Baseline to be "project-specific". Developing a renewable energy project Baseline will require a range of factors, such as the emissions intensity of power generation in the most likely scenario without the project. If the national renewable energy policy regulations are successful, they may result in a decrease in the emissions-intensity of electricity generation in the country. Theoretically, this decrease should *not* be taken into account when developing baselines for renewable energy projects.

It may be difficult for individual project developers to develop the hypothetical baseline emissions for local, regional or national electricity generation projections. Because many developing countries do not yet have in place the types of sophisticated national greenhouse inventories required for the Kyoto Protocol's developed country compliance assessments, there may be a paucity of information available to assist project developers to develop their Baselines in accordance with the Executive Board guidance.

Further Opportunities for Project Finance

Finally, as discussed above, difficulties obtaining project finance (as opposed to mere CER offtake arrangements) has been one of the key barriers to the commissioning of renewable energy CDM projects.

The ability to obtain project finance will depend on a large number of factors, including:

- host country regulation and perceived regulatory and political risks;
- market price for electricity and CERs (and the impact this has on the investment analysis of a project); and
- the familiarity and level of comfort of local and international banking institutions with the CDM as an additional revenue aspect of renewable energy projects.

Although there is no published market price for CERs, it is generally accepted that the market price has increased significantly over the past year since the entry into force of the Kyoto Protocol and the European Union's Emissions Trading Scheme (which recognises CERs as a compliance tool). On the other hand, CER purchasers have commented that there is a scarcity of feasible CDM projects, meaning that demand currently outstrips supply.

The current state of the CDM market has meant that CER purchasers have begun to move away from the traditional "pay on delivery" arrangements that were common in the pre-Kyoto market to packages more attractive to CDM project developers, including:

- upfront payments for some or all of the CER market value;
- the provision of a loan to the project, with repayments of principal plus interest to be set off against payments owing for delivered CERs; and
- buyers working together with banks (e.g. Japan Carbon Finance Ltd. and Japan Bank of International Cooperation) to offer bundled CER offtake and project finance.

Whilst this is a positive step for CDM projects, given that renewable energy projects have longer commissioning periods and generate relatively smaller numbers of CERs than, for example, methane capture and combustion projects, such arrangements may not be as forthcoming for renewable energy projects.

In addition, there is often a lack of familiarity amongst traditional financiers (including local banks in the host country) with the risks of renewable energy technology and the workings of the CDM. Given the undoubted social and environmental benefits of renewable energy, there is therefore an opportunity to build the capacity of such financiers to understand the opportunities offered by renewable energy projects under the CDM. In addition, there may be an opportunity for larger multilateral lenders, such as the World Bank or the Asian Development Bank, to assist local banks to finance renewable energy projects, by "buying out" the difference between the local banks' acceptable risk/return margin, and the margin presented by renewable energy CDM projects.

Finally, countries should consider how the CDM rules themselves could be amended to give special consideration to renewable energy projects and allow them to compete on a more level playing field for CDM investment.

Part V: Conclusions

The CDM can be an effective tool to complement other national and regional regulatory frameworks to encourage the market for renewable energy.

Last year, the first year of the Kyoto Protocol's entry into force, saw a marked increase in the number of renewable energy projects registered under the CDM and also the identification of a number of inadequacies and inefficiencies in the CDM rules and market practice. Many of these inadequacies and inefficiencies are being addressed through amendments to the CDM rules, national regulations or market practice. This year and next will determine the extent to which the modifications to such rules, regulations and market practice result in a significant increase in the number of commissioned renewable energy projects in developing countries.

This paper has also identified a number of further opportunities to increase market penetration of renewable energy projects under the CDM. Such an increase will assist not only to enable developed countries to meet their Kyoto Protocol targets and reduce global greenhouse emissions, but will also contribute towards sustainable development in key developing country economies.

Bibliography

Centre for International Sustainable Development Law, (12/2005), "Strengthening Climate Cooperation, Compliance & Coherence", McGill Université de Montreal.

Charnowitz, S (2003) Trade and Climate: Potential Conflicts and Synergies. Working Draft July 2003, Pew Centre for Global Climate Change.

Chaurey, A., Kamal Gueye, M. and Yuvaraj Dinesh Babu, N. (2003), "Financing Renewable Energy in India: A Review of Mechanisms in Wind and Solar Applications", International Review for Environmental Strategies Vol.4, No.2, pp. 249-163.

Drummond, S., "Trading Instrumental and Risk Management", *A Guide to Emissions Trading: Risk Management and Business Implications*

Dubash, N; Weksman, J and Baumert, K A (2001) Will International Investment Rules Obstruct Climate Protection Policies. World Resources Institute.

Ellis, J (2003) Evaluating experience with electricity – generating GHG mitigation projects. OECD Environment Directorate/International Energy Agency (IEA).

Fenhann, J., (01/2003), "Rules for Small-Scale CDM Projects", UNEP Collaborating Centre on Energy and Environment

Freestone and Streck (ed) (2004) Legal Aspects of Implementing the Kyoto Protocol Mechanisms Oxford University Press

Hodes, G., Nkambule, T. and Beyers, C., (10/2000), "Low-cost Energy Efficient Housing in South Africa", Renewable Energy for Development Vol.13 No.3

IETA and The World Bank (05/2005), "State and Trends of the Carbon Market 2005", IETA and The World Bank

Kim, J.A., (11/2003), "Sustainable Development and the CDM: A South African Case Study", Tyndall Centre for Climate Change Research

Martens, J.W. et al (2003), "Towards A Streamlined CDM Process for Solar Home Systems".

"Renewable Energy Technologies and Kyoto Protocol Mechanisms: Joint Implementation in Central and Eastern Europe & Clean Development Mechanism in the Mediterranean Area", (2003) European Commission, Community Research

Shrestha, R., (2004) "Technological Implications of the Clean Development Mechanism for the Power Sector in Three Asian Countries", International Review for Environmental Strategies Vol.5, No.1, pp. 273-288.

Tang, K (ed) (2005) *The Finance of Climate Change: A Guide for Governments, Corporations and Investors* Haymarket House

UNEP Financing Initiative Climate Change Working Group, (2005), "Finance for Carbon Solutions – The Clean Development Mechanism: The Financial Sector Perspective", CEO Briefing

Venema, H.D., Cisse, M. (ed.), (2004), "Seeing the Light – Adapting to Climate Change with Decentralized Renewable Energy in Developing Countries", International Institute for Sustainable Development

Waller-Hunter, J., (06/2004), "The Contribution of Renewable Energies in Meeting the Climate Change", United Nations Framework Convention on Climate Change

Wilder, M., Willis, M. and Lake, K., (2005), "Commodifying Carbon", *The Finance of Climate Change*, Tang (ed)

Wohlgemuth, N. and Missfeldt, F. (2000), "The Kyoto Mechanisms and the Prospects for Renewable Energy Technologies", *Solar Energy* Vol.69 No.4, pp.305-314

Yamin and Depledge *The International Climate Change Regime: A guide to Rules, Institutions and Procedures* Cambridge University Press 2004