Criteria and Indicators for Appraising Clean Development Mechanism (CDM) Projects

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Executive Summary

This paper proposes a set of eligibility criteria and indicators for the appraisal and evaluation of CDM project proposals. It was prepared by a non-government organisation, HELIO International, through its Global Sustainable Energy Observatory (GEO), jointly with a working group comprised of Climate Action Network (CAN) members. The proposed indicators have been developed with a view to progressing the debate surrounding the CDM and putting forward some practical suggestions to help build consensus among stakeholders in the appraisal of CDM projects.

Section 1 provides a summary of the CDM background, outlining its emergence from the FCCC and where the operational gaps exist. Section 2 sets out the proposed project eligibility criteria, such as appropriate technologies, baselines, supplementarity and measures of sustainable development. Section 3 lists the project crediting and financial additionality criteria, while Section 4 sets out a range of indicators for monitoring a project during its life cycle. An additional set of indicators for monitoring net emissions of greenhouse gases is listed in Section 5, with a graphic representation of the indicators.

It is the hope of the authors that the criteria and indicators recommended in this paper prove to be acceptable to Parties and contribute to the effectiveness of the CDM.

Introduction

Coinciding with the onset of the new millennium is the launch of the Clean Development Mechanism, or CDM - a controversial, complex and as yet undefined mechanism that has as its objective the global reduction of greenhouse gas (GHG) emissions. Should consensus be reached at the Sixth Conference of Parties (COP-6) to the Framework Convention on Climate Change (FCCC), and should approval of the CDM follow, optimistic projections are that US$24 to 37 billion could flow into low-income, non-Annex 1 countries over the next ten years. This unprecedented channel of investment, if well designed and managed, could support innovative projects contributing to the sustainable development of many countries, while reducing GHG emissions globally. The great interest and the enormous number of stakeholders involved in the CDM is therefore not surprising.

At the Third Conference of Parties (COP-3) to the FCCC held in Kyoto in November 1997 it was agreed that three flexibility mechanisms would be constructed in order to increase the number of methods available to Parties to reduce their carbon emissions. These mechanisms are: Joint Implementation (JI), Emissions Trading (ET) and the Clean Development Mechanism (CDM). They provide opportunities for countries to meet a portion of their GHG emissions commitments by implementing measures outside their national boundaries. Of the three mechanisms, the CDM attracts enormous interest because it constitutes a practical link between the countries that are bound by reduction commitments, and those that aren't, on the basis of *'common but differentiated responsibilities*'.

Not only does the CDM provide an opportunity for the realisation of real and measurable carbon emission reductions; it also elevates sustainable development to the same level, making the mechanism distinct from (Activities Implemented Jointly (AIJ) and JI. These dual objectives are regarded as symbiotic, and one may not occur without the other.

Although the theory is sound, caution must be exercised in the design and implementation of the CDM. It must be recognised that a poorly constructed and badly managed CDM process could seriously undermine the new commitment targets of developed countries that are contained in the Kyoto Protocol. It could also handicap the ability of developing countries to fulfil their own future commitments. The elaboration of sustainable development plans within National Agenda 21 in potential host countries, as well as in investor countries, is therefore a first order prerequisite if the CDM is to benefit both categories.

With implementation scheduled for as early as the year 2000, details of how the Mechanism will work in practice remain undefined. This will be a pressing subject for discussion at COP-5 in Bonn.

1. CDM background and operational issues

The 1997 Kyoto Protocol to the FCCC stipulates an overall GHG emissions reduction objective by Annex I countries of 5.2 percent below 1990 levels, taking as the comparison their emissions average in the period between 2008 and 2012. The Quantified Emissions Limitation and Reduction Objectives (QELROS) range from an increase of 8 percent for Australia and 10 percent for Iceland to a stabilisation for the Russian Federation and a decrease of 6 percent for Japan, 7 percent for the United States, and 8 percent for the European Union members collectively.

Dubbed the "Kyoto surprise," the CDM was the product of last-minute negotiations at the close of COP-3, and it constitutes a crucial formal link between the Kyoto Protocol and developing countries. It evolved from the Brazilian proposal for a Clean Development Fund (CDF) in a meeting of the Ad Hoc Group on the Berlin Mandate in 1997, just prior to COP-3. In terms of the CDF proposal, Annex I Parties failing to comply with their assigned emissions reduction commitments in a given budget period would pay penalties, contributing to the establishment of the CDF. The proceeds accumulated in the CDF would be allocated to non-Annex I Parties according to a criterion based upon their historical responsibility for the global temperature increase. The CDF resources would fund mitigation projects in non-Annex I countries and up to 10 percent of the proceeds would be allocated to adaptation measures in vulnerable countries. At COP-3 in Kyoto, the CDM evolved into a mechanism of dual purpose, as established under Article 12 of the Kyoto Protocol. The CDM aims to:

- Assist non-Annex I Parties in achieving sustainable development and in contributing to the ultimate objective of the FCCC.
- Assist Annex I Parties in achieving compliance with their QELROS.

It was agreed that an Executive Board will supervise the CDM and will be subject to the authority and guidance of the COP/MOP. Both public and private entities can be involved in CDM activities.

Emissions reductions will be accounted for on a project-by-project basis and certified by "operational entities" before designation by the COP/MOP on the basis of:

- Voluntary participation approved by each party involved.
- Real, measurable, and long-term benefits related to the mitigation of climate change.
- Reductions in emissions that are additional to any that would occur in the absence of the certified project activity.

A share of the proceeds from certified project activities will be used to cover administrative expenses and to assist developing countries, which are particularly vulnerable to the adverse effects of climate change, to meet the costs of adaptation. The COP/MOP will elaborate modalities and procedures with the objective of ensuring transparency, efficiency and accountability through independent auditing and verification of CDM project activities. As agreed

at COP-4 in Buenos Aires in December 1998, the modalities for the implementation of the Kyoto Protocol will not be defined until at least December 2000. However, a unique feature of the CDM is that the Certified Emission Reductions (CERs) obtained between the years 2000 and 2008 can be used to assist in achieving compliance in the first commitment period from 2008 to 2012.

Establishing sustainable development as a dual objective of the CDM was crucial in earning the support of developing countries. Prior to this shift, there had been some scepticism regarding the benefits of such joint implementation activities being enjoyed equally by high and low-income countries. Moreover, the outgrowth of the CDM from a Brazilian proposal gave developing countries a sense of ownership of the idea.[3] Its workability will help ensure the effectiveness of the Kyoto Protocol in realising its objectives and should increase the willingness of developing countries to participate in a global emissions regime in the future.[4]

Nevertheless, it must be acknowledged that several key issues need to be addressed in order to structure a CDM financial regime in such a way that the benefits of sustainable development and the provision of cost-effective GHG emissions reductions eventuate in practice. Thus the following questions are raised:[5]

- Will the development of the CDM compete with, or be influenced by, other forms of financing for international joint ventures?
- Under which conditions might CDM projects create attractive investment opportunities in countries with small markets?
- How might the planning, development and finance of CDM activities impact on incentives for domestic measures in Annex I countries?
- How will the financing of CDM projects differ in countries at various stages of market development or with different types of markets?
- How will the CDM affect the amount, timing, or distribution of Official Development Assistance (ODA)?
- Can or should ODA be linked to capacity building or to the creation of enabling environments that are attractive to CDM investments?
- Should ODA applied to CDM activities earn, for the "donor" country government, a share of the CERs produced by CDM projects?
- Will investments dedicated to the creation of enabling environments be eligible to earn CERs?
- Can or should bilateral or multilateral development finance be linked to the creation of enabling environments that are attractive to CDM investments?
- How might mainstream operational lending of the regional and multilateral development banks be affected by the opportunities created through the CDM?
- Under what circumstances will mainstream lending projects of the regional and multilateral development banks be eligible to earn CERs under the CDM?

[3] Sari and Meyers, 1998.
[4] Humphreys, Sokona and Thomas, 1998.
[5] Mintzer, 1999.

- How will the availability of investments for CDM activities affect the funding available for GEF projects?
- Should bankable projects that are financed in part with funds from the Prototype Carbon Fund (or similar fund portfolios) be eligible to earn CERs through the CDM?
- How will CDM project criteria and trade measures, such as provisions for the preferential transfer of technology, relate to the existing rules of the World Trade Organisation?

All these questions deserve to be carefully addressed when filling the operational gaps of the CDM.

2. CDM project eligibility criteria

The discussion of principles and criteria to be applied to CDM project appraisals presented in this paper builds on those, which were outlined in Article 12 of the Kyoto Protocol. The operational details were left undeveloped and this discussion aims to contribute to the elaboration of '*...modalities and procedures with the objective of ensuring transparency, efficiency and accountability...*' (Article 12.7). The analysis is broken down into the following topics:

- CDM project selection
- CDM project participation
- CDM project verification
- CDM project crediting
- CDM project financial issues

2.1 CDM project selection criteria

2.1.1 Types of projects qualifying for CDM

Much has been written on the types of projects that should be allowed to qualify for CDM credits in host countries, including whether forestry and land-use change projects should be eligible and if so, under what conditions. Within the forestry, land-use and energy sectors there is considerable debate as to what constitutes a project that reduces GHG emissions and contributes to sustainable development without undermining Annex I commitment targets.

For example, the risks associated with nuclear technology render nuclear power projects unsustainable, even if they reduce GHG emissions. Similarly, if reforestation projects are admitted on the basis of acting as carbon sinks, they may actually impede local sustainable development in the form of agriculture or energy provision for people's needs.

This is apart from the theme recurrent in this paper of the potentially perverse incentives and monitoring problems that CDM projects may already pose. Nuclear energy and anthropogenic sinks are therefore widely regarded as categories that should not qualify as CDM projects. In particular, nuclear power projects should be excluded because of risks to the environment and

human health. Nuclear power is also subsidy intensive at a time when the objectives of the CDM require all available support to be directed towards environmentally and technologically sustainable development. Anthropogenic sink projects should also not be made eligible. It is highly doubtful that so-called clean-coal technologies should be admitted, as they would never represent additional emissions abatement when compared to a reasonable baseline such as natural gas combined cycle plants. Large hydropower projects that have a high surface area to volume should not qualify. All CDM projects must meet the sustainable development criteria (see section 4.2).

Given that large dams which have a high surface area to volume ratio emit quantities of GHGs comparable to those emitted by coal power stations, these projects should not qualify for inclusion in the CDM. Not only are large-scale dams known to result in the loss of biodiversity and the emission of carbon dioxide via decomposing biomass, they are also often associated with the social costs of inequitable land loss and the forced relocation of minority or less affluent populations.[6]

Similarly, any project that is inconsistent with commitments under relevant international environmental agreements should be excluded. This paper proposes that for the first phase of the CDM, only certain energy projects and selected carbon sequestration projects that have contributed to biodiversity conservation should qualify for credits.

Criterion 1: Energy project activities qualifying for the CDM

It is proposed that CDM projects in the energy sector be confined to those that employ technologies and techniques which contribute to:

- ***End-use energy efficiency (leading to real energy conservation).***
- ***Supply side energy efficiency in newly constructed facilities (such as co-generation).***
- ***Renewable energy to supply energy services.***
- ***The reduction of methane emissions from landfills and other waste-handling activities.***
- ***The reduction of N_2O emissions from chemical industries and PFC emissions from aluminium production.***

2.1.2 Reduction in emissions

Article 2 of the Kyoto Protocol clearly states that: *'The purpose of the clean development mechanism [is to contribute to] the ultimate objective of the Convention, and to assist Parties included in Annex 1 in achieving compliance with their quantified emissions limitation and reduction commitments...*'

[6] The World Commission on Dams is presently engaged in a multi-year analysis of these dams and is expected to produce a number of policy recommendations. The WCD is due to provide further guidance on this issue by the end of 1999.

A project can qualify for the CDM only if it results in *'Real, measurable and long-term benefits related to mitigation of climate change' (Article 12b),* and if it results in *'reductions in emissions that are additional to any that would occur in the absence of the certified project activity*' (Article 12c).

Criterion 2: Qualifying sequestration projects

The finalisation of this criterion depends on the outcome of IPCC deliberations on the issue. In the forestry sector, projects that could qualify as much for carbon mitigation as the maintenance of biodiversity and halting desertification, are those that result in sustainable management of primary or indigenous forests and suitably longer-term afforestation schemes. In any land-use changes, respect for traditional land-use rights must be maintained.

Criterion 3: Retrospective accreditation

CDM projects may not be accredited retrospectively. The clear exception is AIJ projects that have met the additionality and baseline criteria.

Criterion 4: Real and measurable benefits

Only projects in which emissions are measurable should qualify for CDM.

2.1.3 Measuring baselines

While the Protocol is clear that only projects that result in emissions reductions should qualify, it does not determine how this reduction is to be measured. Logically, the amount of GHG emissions avoided by CDM projects can be compared with a forecast of future GHG emissions in the absence of the CDM projects. Key to the debate is the question of how to assess what would have happened in the absence of the CDM and this problem introduces the concept of baselines. This issue is being keenly debated with reference to the incremental cost methodology applied to Global Environment Facility (GEF) projects to date.[7] Recent evaluations of the efficacy of GEF projects found that emissions baselines were estimated subjectively and that this contributed to the opaqueness of the process of determining incremental cost analyses.[8]

The level at which a baseline is set will determine the amount of CERs to be generated by the investment. It follows that a higher baseline will be more attractive to both CDM project hosts

[7] 'Top-down baselines typically derive the '*emission rate from existing national or sectoral data, or establish a 'cap' on company sector, or national emission levels*'. Bottom-up baseline '*approaches use a specific technology or reference case for comparison*' and are undertaken on a '*case-by-case basis*'. (Baumert, 1998). Also, business-as-usual/observable baselines assume '*that previous and existing activities in any national setting provide the best gauge of what future activities would be implemented in a CDM project's absence*'. (Hamway, 1999).

[8] Papers presented at recent workshops organised by the GEF Secretariat (GEF/IIED, 1999) have gone so far as to propose the scrapping of this methodological step in project preparation because of the subjectivity inherent in baseline estimations.

and investors as the difference between the baseline and the post-CDM project scenario will result in the larger CERs, and hence a greater return on investment.

However, allowing a baseline to be set too high would create 'artificial' CERs, which would result in 'hot-air' trading and therefore undermine the original objective of the Convention and Protocol. The wide spectrum of possible future development paths in non-Annex 1 countries leads to great uncertainty in long-term baseline estimates.[9]

While a straightforward 'business-as-usual' baseline is attractive for its apparent simplicity, it does not take into account the dynamics of development. Development in many non-Annex 1 countries involves increasing the income of residents and providing access to adequate and affordable services, including energy services, for the urban and rural poor. Depending on which energy sources are used for this development path, rapid increases in GHG emissions could result. However, a business-as-usual baseline will not foresee this and development in low-income countries would thus have to get 'dirtier' before it could get 'clean'. In other words, the CDM could provide a perverse incentive for unsustainable development.

The use of so-called 'forward-looking, bottom-up baselines' could create tensions between real and potential emissions reductions. Its application to some projects may result in real emission increases between current levels and the proposed CDM alternatives. The criterion which requires that project activities result in real emissions reductions needs to be verified from the perspective of the current business-as-usual baseline attributable to climate related policies. This can be achieved by insisting that CDM alternatives must have lower emissions than the current business-as-usual baselines, with credit being given for the difference between the alternative and the 'forward-looking, bottom-up baselines'.

Alternatively, CDM projects that enhance the level of economic activity but have lower emission intensities than the strictly defined or conventional business-as-usual scenario could be creditable under the CDM even if they lead to emission increases. This provision would acknowledge the emissions already avoided by members of the G77 and China.[10]

From an administrative perspective, it is clear that the standardisation of baselines is desirable in order to minimise transaction costs and the possibility of 'hot-air' trading.[11] Conversely, to apply simple baselines that discourage the 'technological leapfrog' model of development because current emissions are below average in many low-income countries would result in a lost opportunity to avoid emissions from the outset. This has to be addressed either through a CDM compatible baseline or by means of another parallel mechanism that intervenes at the time of delivery of new energy service infrastructure.[12]

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[9] Hourcade et al, 1996.
[10] Michaelowa, 1999.
[11] Begg et al, 1998.
[12] An alternative to the unpredictable baseline categories described that would reduce uncertainties for investors, a democratically designed National Agenda 21 could provide a straightforward baseline. With a well-articulated sustainable development plan, it may be decided that only GHGs avoided by CDM projects in conformity with this SD plan could be credited. With such a baseline, it can also be assumed that only the best technologies would be transferred and that eventually SD would result. (Connor, Personal Communication 1999).

Criterion 5: Emissions integrity and baselines

CDM projects must result in lower emissions than the current business-as-usual scenario, credit being given for the difference between the alternative and the 'forward-looking bottom-up baselines'.

The selection of baselines is also likely to impact on the voluntary measures that are already being undertaken in non-Annex 1 countries to remove or reduce market barriers to cleaner production. These measures include the reform of regulatory structures to improve the performance of energy services, as well as improvements to the energy and thermal efficiency of appliances, houses and commercial buildings. The CDM could unintentionally introduce a perverse incentive to relax these initiatives because it lowers the baseline estimates. In other words, the amount of future anticipated carbon emissions is lowered and thus the potential generation of CERs is decreased.

Perverse incentives of this sort would dissuade the implementation of voluntary regulatory instruments for improving energy performance standards. The introduction of the CDM could therefore result in a baseline 'drag'. The potential for baseline 'drag' needs to be addressed if the CDM is to enhance interest in countries reducing their own emissions and maintaining momentum towards making their economies less energy intensive. One solution would be to allow domestic activities in the development of regulatory instruments to qualify for CERs. Funds raised in this manner could be dispersed to local industries in the form of assistance for adaptation to the tightening regulatory environment.

Elimination of producer or consumer subsidies for fossil fuels should be seen as a necessary condition for CER accreditation for reforms to regulatory instruments. Only measures that set genuine incentives for emissions reductions should be accommodated in the baseline.[13]

Criterion 6: Baseline 'drag' and perverse incentives

The process of developing progressive regulatory instruments that have the effect of improving performance of energy consuming devices should be encouraged as domestic CDM projects in their own right, accredited accordingly and banked.

2.1.4 Sustainable development

Article 12.2 states that *'the purpose of the clean development mechanism is to assist countries not included in Annex 1 in achieving sustainable development…'.* This implies that within the project boundary, the pillars of sustainable development would be upheld. For energy, these pillars include economic efficiency, social equity and environmental and technological sustainability.

- **Economic:** The project should result in increased energy sufficiency, reducing the burden on imports of energy for the project area.

[13] Michaelowa, 1999.

- **Social:** The project should result in increased local employment and increased equity in the distribution of resources.
- **Environmental:** The project should result in a reduction in local emissions, including oxides of sulphur, nitrogen and suspended particulates.
- **Technical:** The project should result in increased energy productivity or a greater proportion of renewable energy in the energy supply mix.

Criterion 7: Sustainable Development

CDM projects must contribute to sustainable development in host (non-Annex 1) countries. Sustainable development, including technical and institutional infrastructural needs, must be elevated to a high level in assessing which projects qualify for CDM. All CDM projects must show improvements in environmental and social indicators (see Section 4).

2.1.5 CDM and national public policies

Applying the pre-requisite of sustainable development to CDM projects may potentially be regarded as an imposition on the autonomy of some host countries. However, the objective of sustainable development - which most countries would argue is contained in their policies - is probably less of a problem than how the CDM defines the relationship between international commitments and the sovereignty of Parties.

Criterion 8: CDM and national public policies

Host countries, in appraising CDM projects, should stipulate how the project relates to national public policy and how it addresses sustainable development. Indicators to monitor sustainable energy development need to be applied on a project-by-project basis, reflecting trends within the project boundary and beyond if necessary.

2.1.6 Supplementarity

CDM projects must supplement rather than form the basis of Annex 1 country emissions reductions. Supplementarity implies that the majority of emissions reductions should be derived from domestic action. Because of the potential of the CDM to actually increase overall emissions, it would be a prudent start to allow only a modest percentage of overall reduction commitments to be met through the CDM.

Interpretations of the pre-requisite of supplementarity vary enormously. Costa Rica and other countries that are well placed to deal with sequestration projects, suggest that the CDM should be used to fulfil a greater percentage of the reductions commitments of Annex 1 countries. Conversely, there are cases for keeping the CDM quota to a minimum. The larger the domestic quota for Annex 1 countries, it is argued, the greater the incentive for innovation and rapid

achievement of economies of scale in proven clean technologies. Non-Annex 1 countries, through technology transfer, could then readily absorb the hardware and know-how of proven methods.

Yet another perspective asserts that there should be no quota whatsoever, because quotas would only reduce the funds available to developing countries for implementing sustainable development, and a high quota would discourage ambitious CDM projects. Worse still would be the fixing of separate quotas for each of the mechanisms, which would raise a host of new problems. A better way to ensure long-term innovation would be to apply a decrease in the crediting ratio of CDM projects over time.[14]

Criterion 9: Limits to supplementarity

It is suggested that most emissions reductions need to come from domestic action with the remainder possibly being obtained through flexibility mechanisms.

2.1.7 'Hot Air'

'Hot air' primarily refers to the emissions reductions that have resulted from the shrinkage of the economies of countries undergoing transition, since the 1990 emissions base year. The concept of hot air can also be readily applied to inflated or inaccurate measurement of CERs in either national reporting or in accreditation of project emissions reductions. Wherever it occurs, hot-air will present problems and if this issue is not resolved to the satisfaction of all, it could compromise the integrity of all three flexibility mechanisms.

Hot air needs to be tackled at its source, which is the problem of combining the allocation and trading of CERs.[15] Perhaps the route to take is to accredit only emissions reductions that are climate policy related. This implies that only additional projects that occur as a result of national policy to reduce GHGs should qualify for CDM accreditation. However, the separation of emissions reductions due to economic shrinkage from those due to improvements in efficiency and cleaner generation, constitutes a significant methodological challenge for the Parties to resolve.

Hot air trading could seriously undermine the integrity of the flexibility mechanisms and thus should not be permitted. Alternatively, a one-off deal around historical hot air could be concluded at suitable discount rates and retired, after which time only emissions reductions attributable to climate protection measures could be certified. Another option would be to allow 'hot air sales' with mandatory investment of the proceeds in projects that assist greenhouse gas emissions reductions, but which cannot be quantified in terms of tonnes of GHGs offset. Possible projects may include:

- National monitoring of emissions according to best-practice standards
- An insurance fund for investors in energy efficiency

[14] Michaelowa, 1999.
[15] Grubb, 1998.

- An environmental education and NGO capacity building programme
- Capitalisation of energy service companies
- Financing of energy audits.[16]

Criterion 10: 'Hot Air'

Only emissions reduction units associated with the implementation of climate related policy will be accredited.

2.1.8 Regional equity

A number of African authors[17] have decried the inequity of the regional distribution of AIJ pilot projects - of the 75 pilots only one has been in Africa. They call for a regional quota system that would balance the allocation of AIJ and CDM projects.

It appears that other than slow bureaucracies or government 'wait-and-see' strategies, the main reason for inequitable regional distribution of projects is most likely to be found in institutional capacity shortages. Should these barriers be identified, the CDM Executive Board (or other multi-lateral agencies) could allocate resources to overcome them.

Criterion 11: Regional equity

For sustainable development to be addressed in a regionally equitable way, barriers to the balanced distribution should be tackled where possible by the multilateral agencies or the executive board administering CDM.

2.2 CDM project participation criteria

2.2.1 Capacity to participate

Given that some CDM project stakeholders will be more limited than others in their capacity to invest resources in CDM projects, it is reasonable to assume that this limitation could have the adverse impact of preventing some parties from participating.[18] In such cases it is likely that the countries most in need of the anticipated benefits of CDM projects are those with the least capacity to attract them.

The human and institutional capacity required in identifying, planning, appraising, implementing, maintaining and monitoring CDM projects needs to be built up steadily in order for Parties to participate meaningfully in the CDM. This applies equally to hosts (non-Annex 1 countries) and investors (Annex 1 and non-Annex 1 public and private entities). Capacitated non-Annex 1 countries may have greater access to projects precisely because the institutional capacity to handle these project hurdles would provide a more risk-averse investment environment. This situation

[16] Koch and Michaelowa. 1999.
[17] Sokona et al 1998; Swao and Mwenda, 1998.
[18] Tudela, 1998.

would be unlikely to endure as over-subscription would result in increasingly costly emissions reductions, and cheaper CERs would be sought.

Article 12.8 requires that the COP/MOP *'shall ensure that a share of proceeds from certified project activities is used to cover administrative expenses as well as to assist developing country parties particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation'*. Whether these administrative expenses include resources for institutional capacity building in non-Annex 1 countries, and whether these may only be allocated to Parties making bilateral agreements, needs to be clarified.

If the funds are only allocated to Parties that have already concluded CDM deals, this may result in the perpetual exclusion of some developing countries that do not have an opportunity to develop their institutional capacity to undertake CDM projects.

A management framework for CDM projects is required in host countries at each stage of the process, namely:

- Assessment of projects
- Taking into account economic, social, technological and ecological factors including GHG emissions reductions and other costs or benefits
- Official governmental acceptance
- Monitoring
- Verification

These institutional needs are magnified by provisions that relate to the future sharing between Parties of carbon credits generated by CDM projects. In many low-income countries, there is already a lack of institutional capacity and therefore a disproportionately borne burden, which will result in higher transaction costs.[19]

At the CDM project level, participation of the local populations at all stages of project development must be vigorously pursued. This is particularly important in projects that include land-use change.

Criterion 12: Capacity to participate in the CDM

Capacity building should be undertaken on an expedited basis to prepare both Annex 1 and non-Annex 1 country entities as well as direct project stakeholders for full and equitable participation in all phases of CDM projects.

2.2.2 Voluntary participation

Project hosts and investors (non-Annex 1 and Annex 1 Parties respectively) that participate in projects are to do so voluntarily without the coercion of, for example, linked trade deals or debt

[19] La Rovere and Embree, 1996.

relief programmes. The institutional process that is established for project decision-making will determine the impact on voluntary participation in projects.

Criterion 13: Voluntary participation

Participation in CDM projects must remain voluntary and independent of other international contracts other than those directly affecting the CDM project prospecti.

2.2.3 National policy and institutional decision-making on CDM projects

National policy will need to address the CDM to encourage good governance and democratic decision making processes regarding what constitutes a viable CDM project. To implement this policy in a participatory and transparent manner with local and national stakeholders is crucial for project success and sustainability.

Criterion 14: National and local participation in CDM

National CDM policy development and institutional capacity to participate in CDM projects needs to be undertaken prior to engagement in CDM projects. Where neither enabling policy nor effective institutions are in place, the CDM Executive Board should assist equitably in their development, giving priority to the countries with the least capacity.

2.2.4 CDM project acceptance and lead times

Parties to the FCCC are required to have ratified the Kyoto Protocol via democratic processes and to have developed enabling national policy prior to participation in CDM projects. In addition, reporting protocols ranging from project to national emissions inventories should be in place.

The time horizons for development, ratification and disbursement of funds for projects of this nature by the CDM Executive Board could be lengthy. The bureaucracy of the process may jeopardise the project's outcome, because of declining interest by major stakeholders.

Therefore a streamlined project endorsement process linked to preliminary 'walk through' audits of indicators will be useful at the initial stages of project development in order to ensure the timely release of CDM project development resources. Facilitation and guidance should be provided by accredited third parties to advise the CDM Executive Board of the acceptability of projects with respect to eligibility criteria.

Criterion 15: CDM project acceptance

The ratification process or other national policy steps could include:

- ***Commitments to national communications that include reports on indicators listed in this paper to facilitate the appraisal of CDM projects.***

- ***Multi-lateral Memoranda of Understanding on CDM project development with other ratified Parties.***
- ***Re-orientation towards an 'in parallel' rather than an 'in series' approach to a project development and endorsement process.***
- ***Availability of accredited third party referees of project design and accounting.***

2.2.5 Loss of sovereignty

Protection schemes for vegetation coverage may restrict the use of natural resources and impinge upon national sovereignty. Poor participation of stakeholders and host parties in the design and management of CDM projects may lead to increased technological dependence upon the investor country. In the worst cases, lack of technological self-reliance in host countries may lead to 'technology dumping' on the part of investor countries. In cases where challenges to sovereignty arise during CDM project cycles, the CDM Executive Board will be asked to arbitrate.

Criterion 16: Sovereignty

The CDM must operate with respect to the sovereignty of Parties. Should conflicts arise, the Executive Board should arbitrate and penalise parties that are in violation.

3. CDM project crediting criteria

3.1 Insurance of Certified Emissions Reductions (CERs)

Emissions reductions resulting from CDM projects must be measurable and certified by auditors. Insurance could be taken against the risk of shortfalls in carbon reductions, particularly in the case of project failure resulting from any number of technical, economic, political or other factors.

Criterion 17: CDM project crediting and insurance

CERs should either be banked, post-certified reductions or be insured against potential failure where this is deemed appropriate by the Executive Board.

3.2 Leakage

While a CDM project is required to reduce GHG emissions measurably at the project site, it may be that the project has merely displaced the source and thus resulted in no net reduction of emissions or fewer than it is being credited for. So-called 'leakage' can occur at local or international level. Thus the physical amount of GHG emissions reductions from CDM projects is subject to a certain degree of uncertainty. Keeping track of possible leakages across regions and

especially internationally is an important task, which can add a substantial burden to monitoring and verification bodies.[20] All attempts should be made during project appraisal to assess the likelihood of local and trans-national leakages and these should be included in the assessment of baselines.

Criterion 18: Leakages

Leakage inside and outside the project boundary must be identified, measured, reported and deducted from CERs. In the case of land-use change, projects should be scrutinised from a regional perspective to measure cross-border leakages.

3.3 CDM project verification and reporting criteria

3.3.1 Entities involved in CDM project verification

For the CDM to fulfil its mandate it is essential that confidence should exist in the number and value of CERs. To improve the chances of establishing and maintaining confidence in the CDM, third party entities acting as CDM project facilitators or auditors need to be in place. Similarly, the agreements between investors and hosts require third parties with a keen knowledge of the eligibility criteria for CDM projects. Facilitators could also be trained and assigned arbitral responsibilities in cases of conflict between stakeholders.

In practice, CDM projects would involve two primary levels of engagement. First, between Annex 1 and non-Annex 1 Parties engaged in the project, and second, between project developers and project beneficiaries.

If the project beneficiaries are under-capacitated to make decisions and undertake activities, the sustainability of projects will be severely jeopardised. Facilitators will have to be in a position to assess problems and command the resources to develop an equitable understanding of the implications of Parties' actions.

Criterion 19: Auditing of CDM projects

Verification of CERs must be undertaken by institutions which are accredited by the Executive Board of the CDM and which have no interest in the results of CDM projects. Any potential conflict of interest should be publicly declared prior to accreditation.

Criterion 20: Facilitation of CDM projects

The facilitation of CDM projects must be undertaken by institutions that have a keen understanding of CDM criteria, the requirements for sustainable projects

[20] La Rovere and Embree, 1996.

and the resources to implement them. The CDM Executive Board should accredit facilitators.

3.3.2 Project reporting

In addition to verification, Parties that are both investors in and hosts of CDM projects should report on the progress of these projects and verified CERs in their national communications. Timely and transparent information should also be made available through appropriate public media to keep civil societies abreast of the progress of CDM projects.

Criterion 21: CDM project reporting

Information pertaining to the progress of CDM projects should be included in national communications of Parties to the FCCC and should be made available in an accessible way to civil society in countries participating in the CDM. Reporting should be based on verified CERs and project process monitoring.

3.4 CDM project financial criteria

3.4.1 Allocation of project benefits

Investors from Annex 1 countries will normally choose the cheapest GHG emissions reductions opportunities in non-Annex 1 countries, unless another interest such as technology transfer takes precedence. Assuming low-income countries accept GHG reductions targets sometime in the future, they would then be faced with the leftover, higher costs abatement measures. Early measures must be taken to allow non-Annex 1 countries to invest in future commitments now, or to allow them to gain access to CERs.

Article 12.3a and 12.3b contain a guideline that will contribute to the 'win-win' nature of the CDM. Under the Article, non-Annex 1, host countries will benefit from project activities and Annex 1 (investor) countries will benefit from the accrual of the Certified Emissions Reductions (CERs). This article does not specify the exclusivity of the benefits to the Parties. For example, the CERs could be shared between the Parties, with the non-Annex 1 country banking theirs for sale or transaction at a later date. Indeed, a number of countries, whether Annex 1 or non-Annex 1, could form consortia in undertaking CDM projects, similar to the concept of 'bubbles', that have been proposed for sharing risks, credits and other strategic interests.

Article 12.9 states that *'participation ...in the acquisition of emissions reductions, may involve private and/or public entities'*. The range of entities and the types of partnerships therefore could be numerous. With the advent of emissions trading, this is likely to become the norm.

We propose that any project that has been appraised by the Executive Board as fitting the eligibility criteria should first be offered to in-country private or public entities. This would

address host country concerns that early, least-cost opportunities to meet future commitments may be sacrificed.

In a conventional bidding process, it is anticipated that Parties from investor and host countries would elect to develop a project jointly. At this point, if the project were to be offered to another entity by the host country, it is unlikely that there would be a taker, because the incentive to invest in project development would be lacking, aside from any CDM funds. The project would thus only be viable for other entities if they were to tender the project collectively. In such a case, the host country Party may elect either to remain a sole investor in the project or to invite equity partners to participate. If there are no non-Annex 1 takers, the project may be returned to a CDM clearing-house and auctioned. This approach supports a number of other goals:

- It could catalyse the release of local resources to address local, and therefore global, emissions and promote local investment in sustainable development.
- It would encourage more integrated energy planning in non-Annex 1 countries.
- It would allow non-Annex 1 public and private entities to assist their countries in meeting future commitments to the FCCC by implementing 'no-regrets' CDM projects.
- It could result in non-Annex 1 public and private entities being credited for emissions that they could later trade or use in meeting future commitments under the FCCC.
- It would result in Annex 1 countries investing in CDM projects that are potentially cost effective for them, but which would not otherwise have been cost effective for the host country.

Criterion 22: Emissions reduction benefits

CDM projects should be offered to local public and/or private entities in non-Annex 1 countries before being offered to Annex 1 countries. Should the steps not be taken to realise the project within a given period, the project could then be auctioned on the international emissions market.

3.4.2 Financial additionality

Financial additionality has not been precisely defined, but has been used in two distinct applications, firstly in the context of additionality of projects and their finance, and secondly in the context of the financing of the CDM itself.

Financial additionality in projects refers to the difference between a project that arguably would have been undertaken in a business-as-usual scenario, and the proposed CDM project. To set a financial cut-off as a criterion would be costly and difficult to assess (see Criterion 4). In such instances, independent consultants could be engaged to investigate cost projections.

As one observer put it *'...environmental additionality should be addressed through the definition of a reasonable baseline, involving judgement about what might have happened in the absence of*

the project: reductions from a realistic baseline are additional. Private funds could be considered additional and separate to contributions by parties to the GEF and to ODA. Private funds for CDM projects that meet the environmental additionality test would not need to demonstrate financial additionality. The environmental additionality test would root out commercially viable projects that would have happened anyway from those made possible only by the establishment of the CDM. [21]

Criterion 23: Financial additionality

In order to receive CERs, CDM projects must be truly additional to those that would have been implemented anyway, according to a realistic baseline. This criterion can apply to interventions in business-as-usual projects that show both environmental and financial additionality.

3.4.3 Investment additionality

The second application of financial additionality relates to project funding. Should funding for CDM projects be additional to existing financial channels such as Official Development Assistance, Foreign Direct Investment or the Global Environment Facility funding? Evidence that financial leverage is being promoted through the allocation of genuinely 'new' sources of funding must be shown, otherwise CDM projects may potentially drain the existing resources available to recipient countries.

In the international market today, there is a flow of large capital resources to certain low-income countries seeking short-term profitable opportunities in financial applications. However, much of this capital is not geared to the large up-front costs and long payback periods and risks associated with investments in renewables, energy conservation and afforestation projects. ODA has decreased by 25 percent in the last four years and CDM projects may help plug this resource gap, but should not become a 'replacement ODA'. It would be extremely useful for Parties to fix a baseline for future ODA, detailing the public and private components, prior to the commencement of the CDM.

Criterion 24: Investment additionality

The investments for CDM projects must be additional to existing finance and resource channels.

3.4.4 Technological additionality

In addition to environmental, financial and investment additionality, CDM projects must fulfil the criteria of technological additionality. It goes without saying that project proponents will not dump obsolete technologies using CDM projects. To make sure that this doesn't happen, CDM projects should be restricted to appropriate modern technologies which also fulfill all the

[21] Haites and Yamin, 1998.

requirements of clean operation and long term sustainability. These would not include forms of energy requiring mining of finite terrestrial stocks or leaving behind important amounts of dangerous wastes.

Furthermore CDM projects should trigger better technological development in the host country by requiring that a certain amount of the technology components come from the host country itself.

3.5 Transaction and administrative costs

The costs of administering CDM projects will be at their highest at the outset of the CDM activities, while methodologies are being developed, tested and established in practice. Added to these costs will be levies for adaptation and capacity building of CDM in country, public and private entities as well as the cost of CDM project auditors and facilitators.

At the outset of the CDM, projects will most likely be low cost, at a time when transaction and administrative costs are at their most onerous.

The design of a standardised process approach that is easy to apply and replicate will be critical for the minimisation of transaction costs. A set of streamlined steps should be rigorously applied in establishing a CDM project. Frameworks and models need to be developed to assist entities in their approach to a transaction. It is likely that cross-subsidies from larger to smaller projects will be required.

> ***Criterion 25: Transaction and administrative costs***
>
> ***CDM project cost overheads should be capped on a sliding scale proportional to the full project costs and should reflect the performance of the CDM project rather than being imposed as flat rates.***

3.6 Cost effectiveness

Since increased cost-effectiveness in achieving global benefits is one of the main reasons to promote CDM projects, it will have to be carefully appraised on a project-by-project basis. The resulting costs of GHG emissions avoided by CDM projects can be affected by a number of social, technical, economic and financial project performance factors, besides the uncertainties of baselines and leakages. There is always a risk of poor performance of a technology transferred to another context. In addition, the choices of discount rate and life-cycles for the project evaluations are always somewhat arbitrary.

In order to apply for credits and to establish appropriate sharing mechanisms of credits between the host and investor countries, CDM projects will have to be subjected to continuous monitoring and verification. The corresponding costs will add to other transaction costs and can increase the initial cost estimates substantially. It has been estimated that, given the complexity of the task, monitoring and verification of CDM projects for credit will involve additional costs at least as

high as those involved in the reporting and review process for national communications under the FCCC. This will reduce their claimed cost-effectiveness significantly.

The general perception of lower abatement costs in developing countries can be reversed in some cases by the combined effect of CDM projects with larger costs (and lower emissions reductions) than initially expected, and different macro-economic settings. An example of this is the lower energy prices in developing countries compared with OECD countries. On the other hand, there are non-negligible low positive costs and even negative cost abatement options to be tapped in OECD countries. The adoption of 'no-regrets options' may also be hampered by non-economic barriers or by hidden costs of a cultural or political nature. These may prevent the implementation of otherwise inexpensive mitigation measures.

Criterion 26: Cost effectiveness

In order to achieve emissions reductions that have associated non-economic barriers, costs associated with local environmental, cultural and other externalities must be factored into CDM project budgets.

4. Indicators for monitoring during project cycle

The eligibility criteria for potential CDM projects can be defined in a reasonably objective way, as was discussed in Section 3. However, the appraisal of their contribution to sustainable development is much more controversial. Both investors and host countries will need a consistent operational definition of sustainability that provides an instrument by which the sustainability of a given project can be quantified at any stage in the project cycle.

An effort to identify quantitative indicators of sustainability is crucial to allow for the ranking of available project options that meet the eligibility criteria. These indicators may also be useful after the feasibility study, during post-project evaluation. A standardised process is required that includes host country Parties in project appraisal, with particular reference to sustainable development.

Besides the mitigation of GHG emissions, CDM projects will typically involve other environmental impacts, positive or negative, or will affect sustainable development at local, regional, and national levels. Effects may include:

- Emission of other atmospheric pollutants (SOx, NOx, CO, HC, etc.)
- Production of solid wastes
- Discharge of liquid effluents
- Use of natural resources
- Impacts on biodiversity

Similarly, economic and social impacts at local, regional and national levels will play a decisive role in project adoption. Some so-called externalities may have negative consequences for individuals and institutions which are not directly involved with the project, such as:

- Transaction costs (e.g. the need for additional information and training)
- Further concentration of income distribution

Others that may be regarded as positive include:

- Employment generation
- Foreign currency savings
- Technological development and/or transfer

Of course the proper consideration of externalities is a well-known problem in project analysis and a vast amount of literature is available on this issue. The difficulties encountered in quantifying externalities either in monetary or other terms are not specific to CDM projects; nevertheless, their overwhelming presence in the case of the CDM calls for a multi-criteria approach to cost/benefit analysis.

Some have argued that externalities should be addressed either in the crediting ratio of the CDM projects or by using appropriate discounting techniques.[22] Taking intangible impacts into account may require still other approaches.[23]

Ideally, win-win options should be pursued bearing in mind all four pillars of sustainable development - economic, social, environmental and technological. However, a delicate situation arises when a proposed CDM project involves trade-offs between global benefits and negative impacts at local, regional or national levels.

The indicators proposed below should always reflect positive net values in the case of social and environmental sustainability. In the case of economic and technological sustainability, negative impacts may be compensated for by the foreign investors through the transfer of financial resources and technological skills.

4.1 Indicators of net change from baseline

The contribution of CDM projects to increasing the sustainability of global and national development must be measured against the expected results at the project level, which constitutes the reference case or the baseline.

All these indicators are calculated in comparison with the baseline(s) for the entire cycle of the CDM project. This means that the time horizon is determined by the technical lifetime of the projects. The net changes (positive and negative impacts) between the CDM project and the

[22] Michaelowa, 1999.
[23] Connor, 1998.

baseline(s) are estimated in each case. The results can thus be expressed as percentile changes compared to the baseline(s). The value of the indicators will be positive in the case of increased development sustainability as a result of the CDM project. Negative values of the indicators will represent losses of sustainability in the national development of the recipient country.

4.1.1 Dynamic baselines

It would be meaningless to define business-as-usual baselines as static in low-income countries in the process of economic development when development is, by definition, a dynamic process. The time frame for the crediting of CDM project proposals can span several decades. Allowing an incentive for unsustainable development defies the potential benefits offered by the CDM for technological "leapfrogging".

If a future, graphically depicted by a 'flat line', is unthinkable for developing countries, what could be an acceptable baseline? Linear growth at the same pace as in the past? Or exponential growth adjusted according to the extrapolation of past trends? A mimetic path of development trajectories followed by industrialised countries in the past, using their different stages as milestones? Or employing official governmental projections (usually optimistic, by definition)?

While there is no single satisfactory answer to these questions, it is nevertheless clear that baselines will have to be updated periodically.[24]

4.2 Sustainable development indicators

A desirable approach to coping with this unavoidable uncertainty resides in the definition of multiple baselines using at least two well-contrasted reference cases. Employing this approach, a range of values will result for each indicator, instead of a single value.

This will allow for a sensitivity analysis of results with respect to different baseline assumptions. This sensitivity analysis is very often crucial, given the high uncertainty levels associated with the wide spectrum of possible futures open to developing countries. In many cases, the impact of different baseline assumptions is much larger than the effects of the mitigation projects themselves.[25]

The proposed indicators are grouped below according to the four pillars of sustainable development - namely environmental, social, economic and technological sustainability.

4.2.1 Environmental sustainability

Indicator 1 - Contribution to the mitigation of Global Climate Change

[24] Michaelowa, 1999.
[25] La Rovere et al, 1994; Hourcade et al, 1996.

Global environmental benefits will be measured by the net reduction of GHG emissions measured in CO2 equivalent according to the IPCC GWP for a one hundred-year horizon.

Vector: 0% = No change in GHG emission level compared with the baseline.
100% = Total avoidance of the GHG emissions predicted.

The main difficulty with quantifying this indicator is estimating the leakage. Complete leakage accounting is required within the host country and sometimes abroad, for example, in those projects that aim to conserve indigenous forests.[26]

Indicator 2 - Contribution to local environmental sustainability

Local environmental impacts will be assessed by the percentage change in the emissions of the most significant local pollutant (oxides of sulphur, nitrogen, carbon and other atmospheric wastes; radioactive waste, VOC, BOD (biological oxygen demand), COD (chemical oxygen demand) or any solid or liquid waste). A weighted average percentage change may be used when more than one pollutant is considered to be relevant.

Vector: 0% = No change in emission level of the selected pollutant.
+100% = Total avoidance of emissions of the local pollutant.
-100% = Emissions of the local pollutant are doubled.

Subjectivity is an unavoidable weakness of this indicator, given the necessary selection of sample pollutants for monitoring.

4.2.2 Social sustainability

Indicator 3 - Contribution to net employment generation

Net employment generation will be taken as an indicator of social sustainability, measured by the number of additional jobs created by the CDM project in comparison with the baseline.

Vector: 0% = No change in employment level compared with baseline.
+100% = Doubled number of jobs.
-100% = Elimination of all jobs predicted in the baseline.

This indicator is problematic in that it doesn't register a qualitative value for employment, such as whether the resultant jobs are highly or poorly qualified, temporary or permanent, secure or 'flexible'. Figures are also subject to inflation depending on whether direct and indirect jobs are counted.

4.2.3 Economic sustainability

[26] La Rovere, 1998.

Indicator 4 - Contribution to the sustainability of the balance of payments

Net foreign currency savings may result through a reduction of, for example, fossil fuel imports as a result of CDM projects. Any impact this has on the balance of payments of the recipient country may be compared with the baseline.

Vector: 0% = No change in foreign currency expenditure compared with baseline.
+100% = Total avoidance of foreign currency expenditures.
-100% = Doubled net foreign currency expenditures.

A major difficulty here is that estimates of future prices of imported goods and services replaced by the project can be quite uncertain (e.g. international oil prices).

Indicator 5 - Contribution to macroeconomic Sustainability.

The alleviation of the burden on public savings will be measured by the reduction of direct government (national, provincial and local) investments (including budgets of state enterprises) made possible by the foreign private investment in the CDM project in comparison with the baseline.

Vector: 0% = No change in public investments compared to the baseline.
+100% = Total avoidance of public investments.
-100% = Doubled public investments compared to baseline.

The challenge here is to calculate the saving of public financial resources net of subsidies and to ascertain the additionality of the foreign private investment.

Indicator 6 - Cost Effectiveness.

Cost reductions implied by the CDM project in comparison with the baseline will measure the contribution to increased microeconomic sustainability. The value of this indicator will only be positive in the case of "win-win" ("no-regrets") projects.

Vector: 0% = No change in costs compared to the baseline.
+100% = Total avoidance of costs compared to the baseline.
-100% = Doubled costs compared to baseline.

Accounting for full project life-cycle costs, including education, training, information dissemination, monitoring, verification and other transaction costs may be a huge task. This analysis strongly benefits from the contrast and comparison of two separate project performances, two time frameworks and two discount rates in order to check the sensitivity of the results to these key assumptions.

4.2.4 Technological sustainability

Indicator 7 - Contribution to technological self-reliance

As the amount of expenditure on technology changes between the host and foreign investors, a decrease of foreign currency investment may indicate an increase of technological sustainability. When CDM projects lead to a reduction of foreign expenditure via a greater contribution of domestically produced equipment, royalty payments and license fees, imported technical assistance should decrease in comparison with the baseline.

Vector: 0% = No change in foreign currency expenditures with technology compared to the baseline.
+100% = Total avoidance of foreign currency expenditures.
-100% = Doubled foreign currency expenditures with technology.

Data collection on full technology costs can be difficult in some cases.

Indicator 8 - Contribution to the sustainable use of natural resources

CDM projects should lead to a reduction in the depletion of non-renewable natural resources either through the adoption of technologies with higher energy efficiency or through an increased deployment of renewable resources, such as the replacement of fossil fuels with solar or wind energy.

In both cases, CDM projects will contribute to a more sustainable use of natural resources.

Vector: 0% = No change in non-renewable natural resource use.
+100% = Avoidance of all non-renewable natural resources.
-100% = Doubled use of non-renewable natural resources.

Uncertainty regarding the performance of technological innovations must be accounted for. Again, two well-contrasted project performances can be used to provide a sensitivity analysis.

5. Indicators of net GHG emissions reductions

A complementary way of defining indicators for the appraisal of CDM projects is to examine their impacts on the sustainability of national development in the recipient country and their benefits to the global climate. This allows the indicators of sustainable development to be compared with the project's contribution to the mitigation of global climate change. In other words, this measure would be equivalent to comparing Indicator 1 with Indicators 2 to 8. The former will always give a positive value, as CDM projects must reduce overall CDM emissions.

The other indicators may generate positive or negative values, depending on the performance of CDM projects compared with the baseline in each case. Positive values will denote a contribution to increased sustainable national development and negative values will denote a subtraction.

Seven new indicators can thus be defined, in different units according to each case:

Indicator 9: Avoided emissions of local pollutant
(Tons/tons of avoided GHG emissions in CO2 equivalent)

Indicator 10: Net employment generation
(Number of jobs/tons of avoided GHG emissions in CO2 equivalent)

Indicator 11: Net foreign currency savings
($/tons of avoided GHG emissions in CO2 equivalent)

Indicator 12: Reduction of direct government investments
($/tons of avoided GHG emissions in CO2 equivalent)

Indicator 13: Project cost reduction
($/tons of avoided GHG emissions in CO2 equivalent)

Indicator 14: Reduction of foreign currency expenditures with technology
($/tons of avoided GHG emissions in CO2 equivalent)

Indicator 15: Reduction in the depletion of non-renewable natural resources
(Tons/tons of avoided GHG emissions in CO2 equivalent)

The following figure, the 'snowflake', presents a method for displaying the indicators as a snapshot visual appraisal of CDM projects. The eight indicators are displayed in a scale depicted within eight radial axes from -100 percent (or minus 1) in the outer circle to 100 percent (or positive 1) in the centre of the circle. In cases where values exceed + or -100 percent, the value may be represented as 100 percent point for all values greater than or equal to 100 and similarly at the -100 point for all values greater than or equal to minus 100.

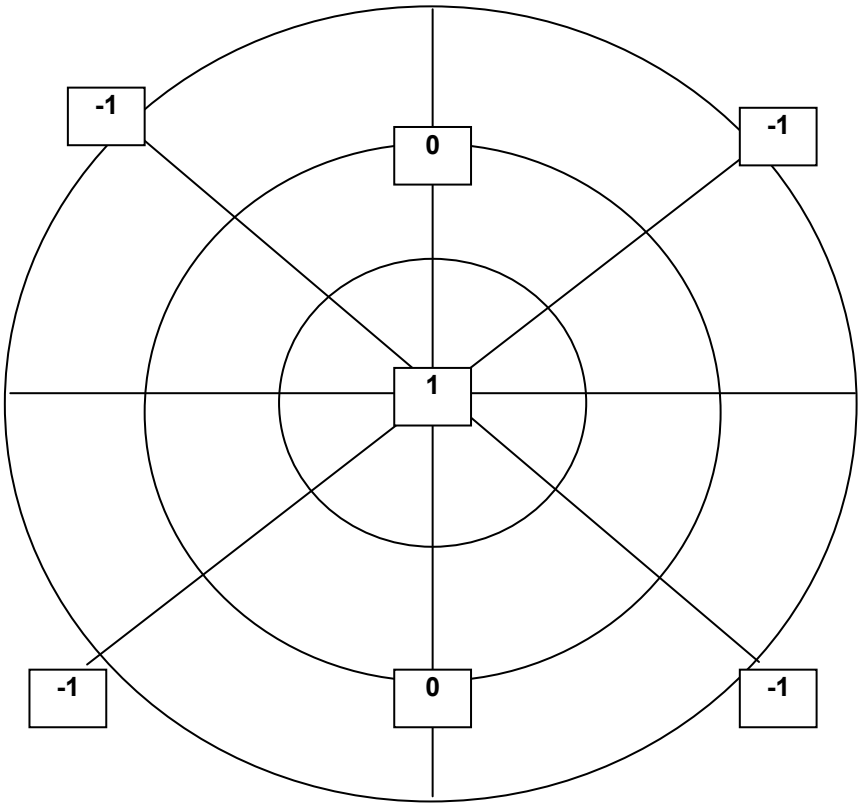

Figure 1. The Snowflake
The zero value corresponds to the same performance of the indicator as in the baseline. Positive values closer to the centre represent contributions of the CDM project towards increased sustainability. Conversely, negative values further from the centre than the baseline represent losses of sustainability.

6. Conclusions

A summary follows of the inherent opportunities and problems involved in the application of global eligibility criteria and sustainable energy development indicators.

The concept of criteria and indicators sets a draft agenda, primarily for host countries where CDM projects will take place. Like all agendas, the items will be revised as the CDM develops and lessons are learned.

The eligibility criteria and indicators can be used both as constraints and as design instruments in devising opportunities to provide a decision-making framework for host countries which may be overwhelmed with CDM project proposals. They will, in short, provide a process approach to the appraisal of CDM projects - and provide input for a decision regarding their acceptance or rejection.

The next stage of development of criteria and indicators would be to test them in actual projects, comparing outcomes and revising them accordingly. The criteria are roughly divided into two groups, namely substantial and operational criteria. Both groups need to be applied to project appraisals and monitoring. The final decision on which criteria are to be used will be political; that is, decisions on which criteria will apply and revisions to be made will be taken by Parties initially at COP-6 and thereafter at the COP/MOPs.

The key areas where political decisions will be focussed are likely to be:

- Baselines
- Supplementarity - i.e. the proportion of emissions reductions that can be gained through the flexibility mechanisms as opposed to domestic action
- The definition of sustainable energy development
- Stipulating the penalty that Annex 1 countries will face in the event of a shortfall on commitments

The case of baselines is very complex, as there are so many factors that influence these projections. All realistic baselines rely on predicting a future - a future that will never eventuate if there is successful project intervention. At the end of the day, the baselines will have to be motivated and criticised, possibly in a public hearing. This implies capacity building in host countries to construct and defend baseline proposals.

There is a wide range of opinion regarding the level of supplementarity and the quotas that should apply to the flexibility mechanisms. Countries that are pursuing afforestation projects, such as Costa Rica, are proposing larger quotas. Others propose smaller quotas so as to test and improve the economies of scale of new and innovative technologies from which southern countries may benefit in future. Still others propose leaving it to the market rather than fixing arbitrary quotas.

The indicators provide a means of testing the extent to which projects contribute to sustainable energy development. It is suggested that for any project to qualify, at least two of the four pillars, namely environmental and social sustainability, must show positive results. It is crucial that host country Parties motivate changes in projects, should any of the pillars not show positive results.

Scenarios should be developed that describe the entire project cycle hypothetically, testing the indicators against the final outcome of the project. The indicators will constitute part of the

reporting on projects to the Executive Board and National Focal Points in both host and investor countries. Independent mediation or technical advice will be required to revise projects if indicators are negative during monitoring.

If the indicators can provide a simple framework they will be more useful as a pedagogical and communication tool. Simplicity will help maintain transparency in the reporting of CDM projects to civil society and other stakeholders. The short list of indicators suggested here may require future revisions as experience is gained, but their application will initiate the process of developing a defined agenda for sustainable energy development.

The best possible outcome would be that their application would become standard practice for internal policy formation among proponents of future energy projects.

The availability of reasonably priced finance will be the engine that drives the CDM. The over-estimation of emission reduction units and the absence of genuine financial additionality are the immediate threats to the integrity of the mechanism.

Finally, negotiators must acknowledge that if CDM projects are to contribute to sustainable development, they must not be initiated prior to the local elaboration of sustainable development plans in host countries. To do so would defy all logic and be self-defeating. These national plans must be prepared now, with the active participation of all stakeholders, if the CDM is to be a positive contributor to emissions reductions, to the actual sustainable development needs of developing countries, and thus to improved welfare globally.

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