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# **Issues and options in the design of the Clean Development Mechanism**

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The Institute for Global Environmental Strategies (IGES)

Climate Change Project

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This report summarizes the current views of IGES Climate Change Project members on the issues related to the institutional design of the Clean Development Mechanism (CDM) introduced by the Kyoto Protocol. It focuses on the intrinsic potential of the CDM as a flexibility measure and as a tool fostering sustainable development of developing countries. Comments are welcome at the address below. (Please quote the version number for citation.)

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# Clean Development Mechanism (CDM)

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## I. Fundamental recognition

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The Clean Development Mechanism (CDM) agreed in the Kyoto Protocol in December 1998 can be not only a mechanism to solve climate change problems cost-effectively in developed countries but also a framework to support “sustainable development” of developing countries, in its original spirit. In other words, measures using market mechanisms including CDM should have a win-win type character. For this purpose, it is necessary to design the mechanism as an attractive option to non-Annex I countries as well as to Annex I countries. Conversely, unless this condition is met, CDM will not be able to function successfully.

It is obvious that developed countries are mostly responsible for current climate change problems. However, it is also clear that the stabilization of GHGs concentrations -the ultimate goal of the Kyoto protocol- cannot be achieved without positive cooperation from developing countries. In this sense, the utilization of CDM would be helpful for developing countries in choosing more desirable development paths, at the same time nurturing mutual cooperation between developed and developing countries. In the future, it is hoped that developing countries will participate in the international Emissions Trading System, voluntarily, summing roles dependent on their respective degrees of economic development<sup>1</sup>.

Accordingly, to make the best use of the CDM’s potential, it will be necessary to design it very carefully. The following two general points in particular should be addressed:

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<sup>1</sup> Given the initial allocation of assigned amount is fair, non-Annex I parties could gain benefits by participating in the Emissions Trading System voluntarily.

- Assisting sustainable development of developing countries
- Attractive design to facilitate investments by Annex I countries.

Also, the following specific points are particularly important:

- Making the best use of CDM as a new channel for technological cooperation / transfer from the private sector.
- Considering regional environment and development in the criteria for approving CDM projects.
- Attaching importance to the role of financial mechanisms that support both mitigation and adaptation measures for developing countries.
- Aiming at the system design to provide attractive investment opportunities to developed countries.

At the same time, of course, the mechanism needs to be practical.

## **II. Image of the CDM**

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### **Possible types of arrangements for funding**

From the viewpoint of capitalizations, there are two types of CDM project arrangements.

#### **Bilateral arrangement**

Entities including both private and public (e.g. government) in Annex I and Non-Annex I countries will make a bilateral contract to implement a CDM project. In this case, negotiations for project arrangements would be either direct or through a broker.

## **Multilateral arrangement**

In the multilateral case, several governments or private entities of Annex I countries make an investment in CDM projects through brokers. Considering the current size of the private capital flow from developed countries to developing countries, (which amounts to \$250 billion per year -five times as large as ODA) the future main actor for CDM will ideally be the private sector.

## **Role of Executive Board and Operational Entities**

### **Executive Board**

The role of the “executive board” of the CDM, as defined in Article 12.4 of the Protocol is to supervise CDM under the guidance of the COP/MOP. While the details shall be decided at COP/MOP, it is assumed that the main role would be the supervision of operational entities, or control of implemented projects. In addition, the executive board may prepare guidelines for baseline-setting, assist in arranging funding of certified project activities (Art. 12.6), and support for meeting the costs of adaptation (Art. 12.8). When this board is organised, representatives from various regions should ideally be included. The board should avoid an overly bureaucratic structure, and its various functions should be clearly defined. The executive board will need to work in corporation with the administrative body for the international GHGs emissions trading.

### **Operational Entities**

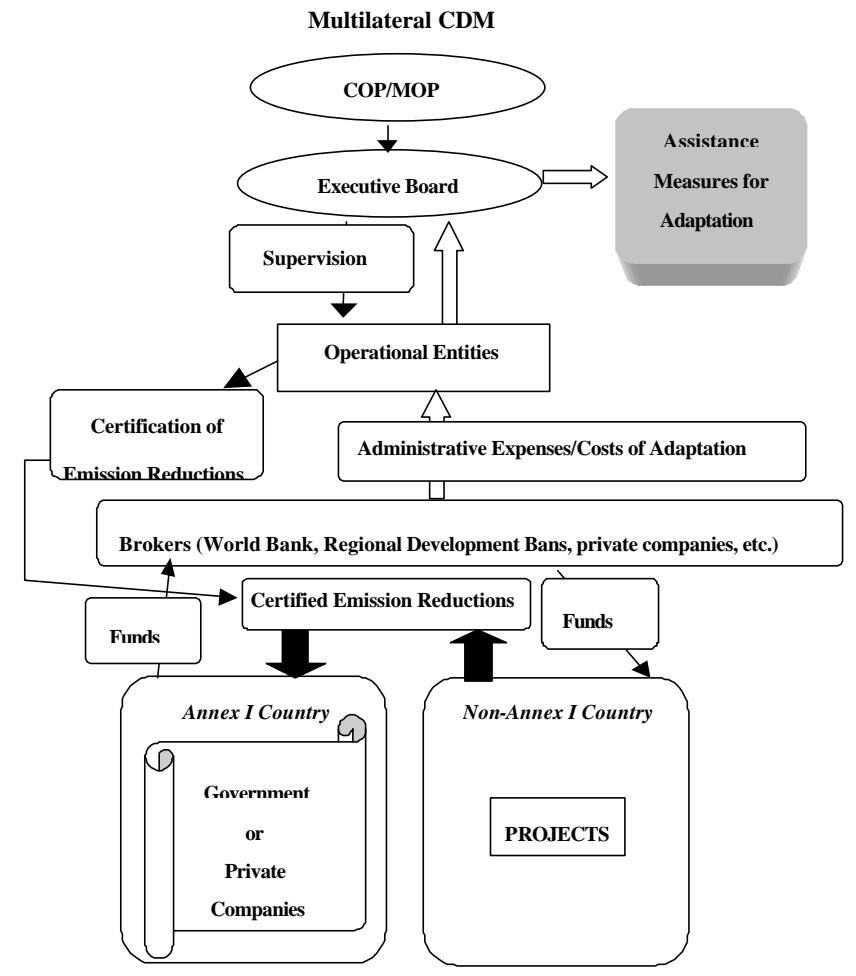
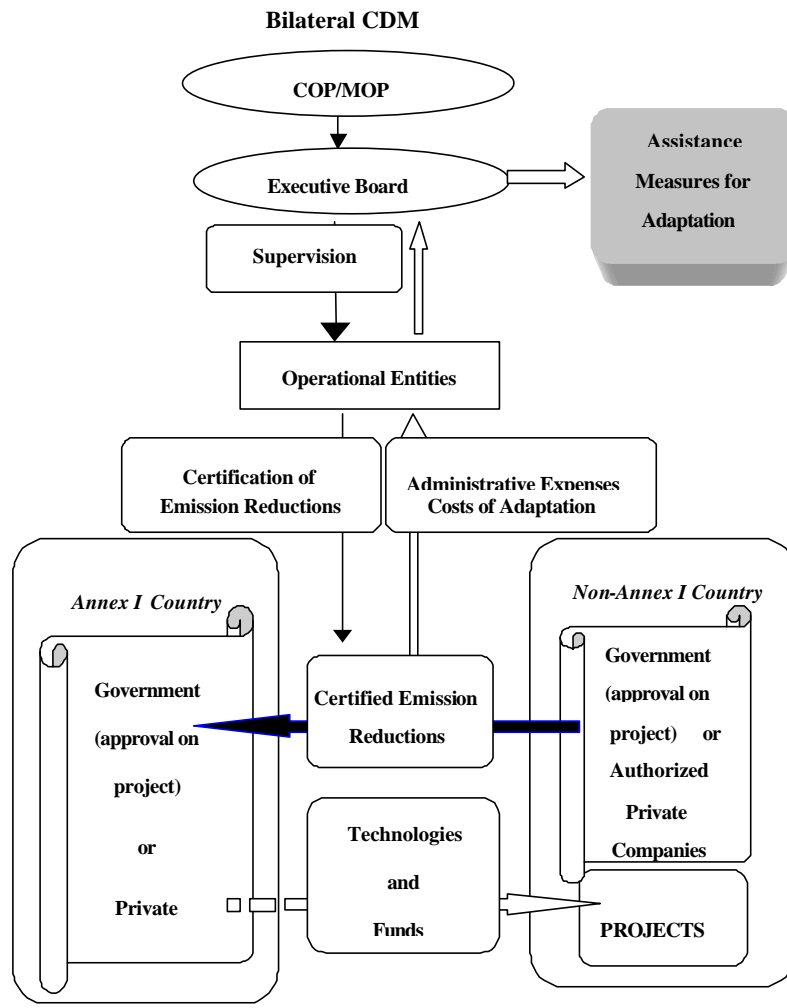
Article 12.5 of the Protocol defines the role of “operational entities” which are to certify the level of emission reduction from each project activity. Additionally, they should also levy administration and adaptation costs.

As a rule, the level of emission reductions should be certified annually. It is presumed that operational entities will evaluate the certification procedures including methodological issues in the first year of the project lifetime, and the accuracy of the relevant data from the subsequent year.

In order to avoid arbitrary certification, it will be necessary that operational entities should conduct certification according to a guideline established by the executive board, making certification results open to public and auditing projects regularly.

The organizational structures of operational entities should not be bureaucratic. In order to certify many possible projects in the future, it is desirable that private agencies with know-







how in implementing projects should become operational entities. Private consultancy firms or regional development banks could qualify for this role. They should be certified by COP/MOP, by passing qualification tests concerning their suitability as certification entities. Such agencies might number several hundreds.<sup>2</sup> Since certification of projects in which the operational entity is itself involved may have a problems in terms of equity, an operational entity should certify only the emission reductions resulting from the project arranged by other operational entities.

It is still questionable whether the executive board could effectively supervise a large number of operational entities. Accordingly, it may be practical to limit the number of operational entities, for example to 10, entrusting a part of the functions to third parties.

## **Clearing Houses**

In addition to the fundamental functions mentioned above, it would be useful to set up “information clearing houses” with a data base function to service CDM with information relevant to needs of host countries and those of investing countries. This function could either be operated as a subordinate organization of the executive board or decentralized to each operational entity. Private consultancy firms could also have such a function as a part of their customer services. Further discussions are necessary to examine the suitability of these options. For instance, basic information on CDM could be managed by a subordinate organisation of the executive board, while an independent database could be maintained by individual project brokers.

In reality, private firms are assumed to possess considerable information related to project identification. Therefore, in order for clearing house to function effectively, it is vital that they should have a mechanism to provide information to market participants smoothly.

## **III. Eligibility for CDM projects**

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<sup>2</sup> When there are more than one operational entity, there may be differences in auditing or certification methodologies taken by different entities. Given the expertise required for certification, it may be useful to nominate operational entities according to their expertise in the types of the project.

## **The CDM as stipulated in the Protocol**

According to the Article 12 of the Kyoto Protocol, the purpose of the CDM is:

- To assist non-Annex I Parties in achieving sustainable development and in contributing to the ultimate objectives of the Convention.
- To assist Annex I Parties in achieving compliance with their quantified emissions limitation and reduction commitments (QELROs).

By carrying out CDM project activities, Non-Annex I countries will benefit from the projects, and at the same Annex I countries may count certified emissions reductions towards their compliance of QELROs.

Regarding the certification of project activities, the following three points are listed as items of appraisal.

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

## **Criteria**

As stated above, the countries involved should approve the CDM project in advance. Although there is no particular mention in the Protocol of required approval conditions, some criteria need to be formulated for the Operational Entities to certify emission reductions smoothly. The following points merit consideration.

1. Assisting Non-Annex I countries in achieving sustainable development.
2. Contributing to regional economic development and preservation of the environment of Non-Annex I countries.
3. The projects must contribute to measurable and long-term GHG.

4. Reductions in emissions are additional to any that would occur in the absence of the project activity (additionality of emission reductions).
5. Information that satisfies the above criteria should be submitted to all relevant Parties and be up-dated regularly.

The Protocol does not refer to “financial additionality”. We will examine this issue from the point of view of “additionality of emissions reductions” in the next chapter.

## **Necessary provisions for guidelines**

Countries approving CDM projects would do so in line with criteria as mentioned above. Additional guidelines meriting consideration are as follows:

1. The projects should not be temporary and should accompany technology transfer. At the same time they should have a middle/ long-term effect including capacity building so that the transferred technology to can take root in the host country. Depending on the scale of the project, macro-economic effects should also be considered.<sup>3</sup>
2. The guidelines should take regional character into consideration. Evaluation should include, for example, environmental assessment such as analysis of emissions of pollutants and preservation of biodiversity, creation of new employment, and avoidance of negative impacts on regional culture and community. It may be also desirable that each host country lays down original guidelines.
3. Measurability of emission reductions throughout the project life is important. Those who implement the project as well as the investors must have comprehensive knowledge of the methods of data collection and measurement and their accuracy prior to project implementation. It is also important to assure that the overall effectiveness of the

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<sup>3</sup> Direct impacts include the increase in foreign currency reserve and inflow of capital, while indirect ones include new employment opportunities and economic growth. As the project proceeds, capital and technology will flow into the country concerned. However, the extent of the influence on creation of new employment is generally uncertain. (In some cases, introducing efficient technology could put pressure on regional employment.)

emission reductions from the project should not be canceled out by any negative effects.<sup>4</sup>

4. The executive board should have the authority to decide the method of baseline setting, and the operational entities certify the amount of emissions reductions. Project implementing entities should evaluate the effectiveness of the emission reductions from projects in advance, allowing a certain latitude, when applying for the government approval. It is desirable that these pre-project estimates should be corrected according to the results of actual “certification of the emission reduction by operational entities” which should ideally happen every year.
5. Those who implement the projects must guarantee that relevant information is clearly reported and regularly updated. In the event of a failure in meeting the conditions required by the guidelines due to unexpected conditions, immediate notice should be given to the governments concerned so that they may cancel the approval.

Although these are some points deemed to be necessary for the project approval guidelines, practically, more concrete and quantitative specifications will be required.

## **Issues related to financial additionality and commercial projects**

The Protocol does not refer to “financial additionality” of CDM projects, only mentioning the additionality of emissions reductions effectiveness (Article 12.5). However, as many argued in the INC negotiations prior to COP 1, it is necessary to build a consensus on this issue in order to prevent confusion during the approval process.

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<sup>4</sup> For example, in the case of forest projects (such as afforestation, reforestation, and forest preservation) implementing entities should guarantee that the forest would not be cut down soon after the termination of the project, etc.

An arguable interpretation of the Kyoto Protocol would be that financial additionality is another aspect of the additionality of emissions reductions. In other words: in comparison with a “no project” case, if the project in question (which may generate credits) will be implemented without being approved as a CDM project, it will conflict with the conditions of the additionality of emissions reductions referred in the Protocol. Application of the evaluation of this financial additionality of the project could be used as one of the criteria for CDM project approval judgement.

Distinction between commercial projects and CDM projects may be related to baseline setting; however, we consider baseline issues as more technical ones which should be examined separately.

There may be two kinds of financial additionality: That involving public funds and that involving private funds. In the case of using “public funds” for projects, there will be no particular problem, provided the funding source of CDM projects involved “different purpose funds” from Official Development Assistance (ODA), or if it is proven that the total amount of ODA funding increases after the year 2000 in nominal terms. However, in all cases other than simple nominal alteration of existing ODA, the additionality of emission reductions may be difficult to demonstrate.

Regarding private funds, approval of commercial projects that are profitable themselves might conflict with the condition for “additional emission reduction” mentioned in the Protocol. That is, commercial projects may have gone ahead even were they not to have been approved as a CDM project generating credits.

The following points are examples of potentially complex issues arising in this less straightforward area:

- Some projects might have less possibility of being implemented even if they stand to be profitable, due to factors such as various types of risk, lack of information, obstacles related to cultural differences, a lack of funding or credibility on initial investments.
- Various conditions need to be met for commercial projects, taking several indices for their profitability such as return on equity (ROE) etc. and various risks involved into consideration. Because of this complexity and the high confidentiality of commercial projects, it is difficult to establish general rules for judgement based only on profitability.
- It may be possible to approve a part of a commercial project as a CDM project, for example, “additional” installation of an expensive energy saving appliance, but not the whole project.

- One may infer that profitability is an issue best left to the investors and should not be taken as an issue germane to all relevant parties involved in the consideration of the project's suitability as a CDM candidate. For example, in the case of installing energy saving apparatus, if the host country is able to gain profit exceeding its implementation cost (no-regret project), the project may be approved as a CDM.

It is difficult to generalize about these issues. Accordingly, the most practical way forward seems to be would be for involved countries to judge the appropriateness of projects on a case-by-case basis, paying attention to the contribution to sustainable development of developing countries.<sup>5</sup> In this way, as a casebook of CDM project experience builds up, it ought to become progressively easier to make good CDM project selections in the knowledge of what has worked historically.

## **Treatment of sink projects**

### **Discussion of the role of sinks in Annex I QELROs**

In considering the inclusion of sinks in targeted CDM projects, it is necessary to understand the discussion over the interpretation of sinks stipulated in the Protocol. According to Art. 3 of the provisions on QELROs, the net changes in greenhouse gas emissions by sources and removals by sinks (resulting from direct human-induced land-use change and forestry activities) are limited to afforestation, reforestation and deforestation since 1990 (3.3). As for other sinks which are not specified in the above provision, (e.g. agricultural soils, land-use change and other forestry activities), the COP/MOP1 has yet to decide on the modalities, rules and guidelines for their inclusion to the activities to meet the QELROs commitments of Annex I Parties. (3.4)<sup>6</sup>

Treatment of sinks involves a high degree of uncertainty in measurement and durability of emissions reductions, and has been a contentious issue in the Protocol negotiation process. At the last SBSTA-8 in June 1998, some argued that broader interpretation of enhancement of sinks

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<sup>5</sup> A clear line should be drawn between this issue and certification of emission reduction by the operational entities.

<sup>6</sup> Further discussions will take place at the SBSTA with reference to a special report by the IPCC assessing scientific and technical implications of the Protocol ready for COP6 in 2000. In connection with the banking provision of the certified emissions reductions starting in that year, it is necessary to consider early measures before the decision by COP/MOP.



other than those stipulated in the Protocol should be approved, while others expressed concern over blanket inclusion of all land- use and forestry activities in sinks. Lax approval of sink related projects including ones with great uncertainty would make the meaning of the legally-binding commitment targets in the Protocol ambiguous. Depending on the definition of ‘sinks’, their ratio in the total emissions could easily become significant. Besides, at a more fundamental level, this would distract the Protocol from the original spirit of tackling CO2 emissions from fossil fuel dependence.

## **Inclusion of sinks in potential CDM projects**

Whereas Art.6 JI provisions refer to projects aimed at reducing emissions by sources or enhancing anthropogenic removals of GHGs by sinks (6.1), the CDM provisions refer only to projects that provide reductions in emissions. They do not specifically refer to land-use change and other activities in the forestry area.<sup>7</sup> From the point of view of the consistency between Art.6 JI among Annex I Parties and CDM, and the interpretation of the projects that provide reductions in emissions, it can be perhaps be argued that sink projects ought to be eligible for inclusion in potential CDM projects.

However, whether the CDM includes sink-related projects in addition to those specified in the Protocol Art.3 is a complicated matter and requires careful consideration. In particular, forest management and forest conservation could become disputed, since some countries carry out such projects as AIJ.

For forest management and conservation, technological and scientific uncertainties concerning the measurement of anthropogenic removal by sinks will be considerably problematic, as well as the methodologies of baseline setting. In particular, if the rate of forest loss is reckoned in the baseline, there may be an incentive to inflate estimates of decline rate. As a result, countries without appropriate forest management policies might be able to take advantage of sink-related CDM projects.

Forest conservation projects do not involve technology transfer, and in principle, are inexpensive

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<sup>7</sup> Emission reduction units generated from JI projects are part of the assigned amounts, therefore they should be treated as the same as Art.3.4 .

compared with complex structured energy-related projects. As they can leverage funding from other sources than those solely aimed at offsetting CO<sub>2</sub> (Evans&Tanabe 1994), there might be a possibility of setting up a special purpose fund for forest conservation/ forest management projects within the CDM mechanism.

## **CDM as a tool for sustainable development of developing countries**

Forest management and conservation projects will be effective in terms of developing countries' sustainable development and protection of biodiversity. Accordingly, it is arguably obvious that they should be promoted in this context. Despite international effort towards sustainable forest management, including FAO or ITTO, the Debt for Nature Fund set up by environmental NGOs and the Statement of Forest Principles adopted at the Earth Summit 1992, forests in developing countries are being depleted at a fast rate. Although the direct causes of deforestation are slash-and-burn farming, excessive collection of fuel woods, land-use change and commercial logging, behind them lie fundamental problems including poverty and population growth as well as market distortion and the lack of appropriate domestic policies. Many developing country Parties recognize the CDM as a tool for sustainable development in non-Annex I countries which should also contribute to climate change objectives. In this sense, it may serve the ultimate aim of the CDM for the funds from developed countries targeted at climate change to be used for forest conservation.

It is important in this context, to examine all possible loopholes arising from inclusion of broad sink-related activities. The following options merit consideration:

- 1 ) Approve only the kinds of projects specified in Art.3 of the Protocol referring to the IPCC Special Report, and await the decision by COP on the treatment of sink-related projects before taking further action.
- 2) Apply discount rates to the certified emissions reductions (CER) generated from the CDM, taking into account uncertainty associated with baseline setting and positive/ negative externalities (Michaelowa, 1998) of each project.

## **IV. Issues of baseline establishment**

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### **Baseline establishment**

To identify how much a CDM project contributes to emission reductions, it is important to establish the baseline, which refers to the level of GHG emissions for the case without the project.<sup>8</sup> The determination of baseline should be more precise for CDM projects than will be the case with Joint Implementation (JI) in Art.6.<sup>9</sup> The difference with JI is that the host country of a CDM project has no limitation of GHG emissions.

### **Methods of baseline establishment**

#### **Concept of a baseline**

The experiences of Activities Implemented Jointly (AIJ) projects indicates that the main obstacle to expanding projects is the high transaction costs. With a view to reducing the transaction costs,

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<sup>8</sup> Here the word 'baseline' simply indicates the case without CDM projects, however, as mentioned later, this is a rough definition and needs to be defined more accurately in actual operation. The definition is not necessarily related to the concept of 'the case without CDM projects' in the concept of macro-baseline (CCAP). 'Baseline' could also be applied to an economic sector, or to several sectors in a region. However, in this report, 'baseline' is assumed to apply to each individual project.

<sup>9</sup> In the case of Article 6 JI, the implementation of JI projects will not change the total emissions amount of Annex I countries as well as the global emissions since the transferred emission reduction unit (ERU) is a part of the assigned amount. Therefore, if the transfer area is not quite accurate, there will be no change in the total amount of world GHGs emissions. On the other hand, in the case of CDM projects, if the transfer area was not clearly indicated, the total amount of world emissions would increase.

the baseline setting procedure should be as practical and simple as possible. Therefore, it is necessary to select the best method with balanced interests between minimizing these costs and maximizing environmental quality. Considering the provisions of banking Certified Emissions Reductions Units (CERUs) starting from the year 2000, gradual improvements may be a practical option.

## **Methodology of baseline determination**

A baseline of a CDM project can be determined by applying several parameters to variable factors which represent major aspects of the social, economic and technological conditions of a host country. This method may reduce the possibility of making an arbitrary choice in baseline determination, as well decreasing transaction costs of negotiation. Important elements of baseline determination are as follows:

### **1. Parameter choice**

If baselines were to be set up by different standards for each project, the determination of baseline would become arbitrary and engendering high transaction costs of negotiation. To obviate this, standard economic and technological parameters need to be chosen for determining the baseline. Important variable factors in baseline determination could be categorized into several components, then, a set of parameters should be established for each project. Example of parameters of these categories include:

- thermal efficiency of the plant,
- the rate of carbon contents in fuel
- other factors such as time-scale, uncertainty etc.

### **2. Generalization of parameters: micro-baselines vs. macro-baselines**

The baseline setting procedure should be as simple as possible. It is necessary to generalize some parameters in order to represent several factors changing in a similar direction. A key issue here is whether to use world standards, national standards, sectoral standards, or project specific standards, or a combination.

### 3. Consideration of time-scale of a project

Since a CDM project will operate for an appreciable amount of time, various factors are likely to change over time. The practical issues arising involve timing of certifying and granting credits, period of certifying credits, and the change of baseline over time.

- Timing of certifying and granting credits

It may be necessary to discuss the best timing for granting credits. The general understanding, arising from Art.12.3 (b) of the Protocol, is that the credits from a CDM project should be granted only after verification of the amount of GHG reduction involved. Still, it might be possible to say that credit could be granted prior to the launch of a project since the amount of GHG reduction can be estimated quite precisely, once the baseline and the reference level of emissions of the project are determined. Another issue is the timing of certification. The issue here is whether the credits should be certified annually, or only after completion of the whole project.

- Term of credit setting

It should be determined whether to set credits for the whole life span of the project or only for the first several years.

- Parameters changing over time

A baseline may alter over time, reflecting the change of some parameters. In a static state, certain reference point prior to the project implementation is determined, and the baseline can be set based on the data of that year (or based on the average data of several years). In a dynamic state, there are four options for dealing with changes in parameters of a baseline over time.

- Fixed baseline free of time sequence
- Variable baseline, with the direction of changes fixed in advance and the changes in parameters set to be constant.
- Variable baseline, with changes in parameters also variable.
- The baseline is revised annually after the launch of a project.

It needs to be pointed out that the design of a baseline will make a great difference in administration costs of certification.

- Determination of baseline and its effect on the incentive to obtain credits.

Some conditions of baselines may pose disincentives to investors. First, a national energy policy to decrease CO<sub>2</sub> emissions to zero will generate a disincentive to invest in CDM projects. For instance, Costa-Rica plans to have net CO<sub>2</sub> emissions decrease to zero by the year 2001. If a macro-baseline, which encompasses the whole national economy, was set up based on the present energy policy, investors of a CDM project in this country would not be able to obtain any credit from the year 2002.<sup>10</sup>

Secondly, the implementation of a CDM project itself could affect baseline conditions in a country with a small economy. A large CDM project would lead to a dramatic reduction in GHG emissions of the country and bring about considerable change in parameters of a previously determined baseline. The more CDM projects are implemented, the less credits would be generated, making later projects less attractive to investors in Annex I countries.

#### 4. Uncertainty over baseline setting and monitoring

Handling of uncertainty should ideally be built into setting of baselines and monitoring of the amount of emission reductions. This is particularly so of projects involving sinks. As mentioned earlier, when the baseline is set taking into consideration deforestation, those who implement the project may have an incentive to underestimate its baseline in order to increase credits obtained from the project. In the case of afforestation projects, the estimation of actual emission reductions is quite uncertain due to the generally low quality of monitoring techniques.

One idea under consideration is that any uncertainties over baseline setting or monitoring should be reflected in the procedure of credit calculation. One possible method for this is to discount the amount of credits in proportion to the level of uncertainty. For example, the discount ratio could be varied depending on the type of the project.

#### 5. Other options

In addition to the matters discussed above, other elements could also be incorporated into baseline establishment, as follows:

- Incorporation of domestic reduction efforts of Annex I countries into baseline setting (Observable Baseline):

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<sup>10</sup> Provided that emissions decrease with reduction measures other than CDM projects.

Some hold the view that Annex I countries should not neglect domestic reduction efforts even though they may be able to reduce GHGs more efficiently by implementing CDM projects in Non-Annex I countries. If measures were to be made available to reflect domestic reduction efforts in baseline setting at the time of CDM project implementation, the incentive to make efforts to reduce domestic emissions could be stronger in Annex I countries. For instance, it is pointed out that the reduction effort of developed countries should be taken into account in certifying the amount of credit. If a credit discount system is introduced in which the amount of credits obtained by developed countries would decrease unless they make sufficient reduction efforts (Hamwey, 1998), this would serve to incentivize Annex 1 countries to enhance domestic reductions.

- Growth Baseline:

With regard to the macro-baseline of a developing country, a long-run baseline could be set with reference to the amount of carbon emissions per GDP. This method would entail a macro parameter changing over time. The Center for Clean Air Policy (1998) has argued that the baseline for total emissions of a developing country should be set by using carbon emissions per GDP, taking into consideration that the increase of emissions is proportional to the GDP growth.

## **V. The credit sharing issue**

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### **Basic concept**

One view holds that it is not necessary for Annex I countries to share emission reduction credits with entities of non-Annex I countries, since the latter have no QELROs commitments. Annex I countries in contrast obviously prove both funds and technologies in pursuit of credits. However, were non-Annex I agents to be allocated credits, they would then be able to participate in the international market of emissions trading and so could gain experience of trading. They might also have the option of banking credits for future use. Such experience would stand to make developing countries feel more positive about entering the trading market voluntarily, and even to participate in the Convention with the same obligations as developed countries. Were this to prove the case, the chances would cap the emission limits globally, thus making it possible to achieve the ultimate objective of the Convention.

Several studies of Activities Implemented Jointly (AIJ) demonstrate that transaction costs tend to be quite high, impeding the progress of the projects. In general, therefore, it may be desirable that some guidelines for credit sharing are prepared based on the cost burden with the aim of reducing the transaction costs. One problem with making general guidelines, however, is that there are various types of project with idiosyncratic factors (Nordic Council of Ministers 1997). In any case, it is most likely that distribution of credits will be decided in bilateral negotiation.

## **Four key points**

There are four key elements relevant to credit sharing (Nordic Council of Minister 1996). For the sake of simple argument, here we only deal with the projects contracted between governments of Annex and non-Annex I countries.

### **The size of the donor country's financial contribution**

It is quite simple to allocate credits to a donor country based on the financial contribution to the project. However, there are considerable differences in size and character of contributions (e.g. technological, managerial and consultation, as well as financial), and it is uncertain to what extent contributions other than funding will be evaluated in credit sharing negotiations. In addition, since credit sharing will depend on the type of financial assistance, it might be difficult to establish a standardised formula to evaluate the contribution of the donor country.

### **The host country's contribution**

The evaluation of the contribution of the host country should include contribution of infrastructure or manpower necessary to implement CDM projects as well as the financial aspect. It would, however, be quite time-consuming to negotiate the adoption of such a basis for evaluation of credit sharing. In this respect, the CDM process should ideally have some negotiated guidelines.



## **The profitability of the projects and credit sharing**

Some CDM projects can be unprofitable by themselves. In the case of such unprofitable projects, it may be justifiable for donor countries to share relevant credits with the host country, if it bears the financial burden of the project. In the case of a profitable project in which the invested facility is to be owned by the host country, it may be valid for the donor country to receive all the credit, when the host country can expect financial returns from the project.<sup>11</sup> It will depend on case-by-case negotiation as to whether or not the credits would be distributed in addition to such financial returns. In reality, a host country- being eager to invite the projects with higher profitability- may offer advantageous terms to the donor country, and the amount of credits received by the host country might be nil, or, very little, if any.

## **The reduction costs in the donor country and credit sharing**

The domestic marginal abatement costs of a donor country sets the upper limit of the costs of investment in a CDM project the donor country can pay. The donor country will implement the project in order to acquire the emission reduction credits only if the costs of the project are lower than those of domestic emission reduction opportunities. Therefore, in the negotiation on the credit sharing, the least amount the credits the donor country can accept must be equal to the amount of the emission reductions it can achieve domestically with the same costs as the CDM project. The donor country will negotiate a share of credits with the host country within the range between the amount by which the emission reductions which would have been domestically attained and the amount of the credits which is expected to generate in the project. When the former is equivalent to the latter, donor country may receive all of the credit - at least it might require that.

The methodology of credit sharing is one of the important factors investors will consider in their decision on whether to invest or not. One developing country would compete with one another in their terms of investment. This might resemble the situation that the newly industrializing economies competed for inviting foreign investors giving favorable tax treatment. Therefore, it

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<sup>11</sup> This may only be the case with the facilities constructed as ODA-related project. The issue here has a lot to do with the definition of additionality - whether commercial projects should be eligible for CDM projects

depends on the demand of non-Annex I countries for the CDM projects how advantageous a share of credits is to Annex I countries. If the CDM project was attractive for developing countries, heavy competition might occur.

## **VI. Funding for adaptation**

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### **New funding mechanism**

Art.12 states that the CDM shall cover its administrative costs and 'assist developing country parties that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation' through project revenues. (12.8) Art.4.8 of the Convention enumerates measures such as funding, insurance and technological transfer that meet the specific needs and concerns of developing country Parties arising from the adverse effects of climate change, especially on small island countries, countries with low-lying coastal areas etc. Considering the fact that no concrete progress has been made the entire 8years of the negotiations, it can reasonably be assumed that the relevant developing countries will have high expectations if the CDM.

However, it cannot be denied that raising funds for adaptation measures using the CDM may distort Annex I countries' incentive to invest, especially, since Art.6. JI does not bear such a levy. Here we would like to examine some of the points relating to the funding for adaptation.

The subject areas of current vulnerability assessment undertaken in many Country Studies include coastal zone management, agriculture, forestry, water resource, fisheries, etc. Thus, potential adaptation project activities will be numerous. Judging from the potentially broad coverage area of the adaptation project activities, it is unrealistic to expect that CDM would be

able to deliver huge resources to the regions mentioned in the Art.4.8 of the Convention.<sup>12</sup> In this connection, Annex II Country Parties in principle, are to assume obligations under the Convention, regardless of the adaptation funding from CDM mechanism. Identification of the vulnerable countries, nature and kind of assistance and the ‘share’ of the proceeds to be used for this purpose will depend largely on the political choice of the future negotiations. A form of CDM between and/ or among developing countries may be possible depending on the interpretation of the provision stipulating that ‘the purpose of the CDM shall be to assist Parties not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the Convention, and to assist Parties included in Annex I in achieving compliance with their QELROs under Art.3’ (12.2). In other words, if one understands the CDM as a mechanism generating credits which help Annex I Parties meet their commitments, it is possible for a developing country Party to participate in the CDM by investing in a project in other non-Annex I countries. In this case, further consideration may be required as to some burden-alleviation arrangements for developing countries.

## **How to raise funds for adaptation**

There are two points to be considered in this respect:

- On what should the raised funds be based, and;
- How should the funds raised in the form of credits from CDM projects be converted into money.

On the first point, possible options include:

1. Individual projects may be levied as lump-sum tax, or credit for the costs of adaptation. This will, from an economics perspective, cause the minimum distortion of the incentive to invest. However, this may discourage participation in the projects.

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<sup>12</sup> Estimated amount of funds for adaptation measures in 2010: Suppose that Annex I countries apply the credits from the CDM for 5% of their total emissions. If the market price of CDM credit was \$20 per ton carbon and 10% of each credit were to be used for adaptation measures, the total funds for adaptation would amount to be around \$400 million annually.

2. Funds may be raised by charging a certain percent of a project costs. The effect of this is equivalent to increase in the costs necessary to implement the projects, thus resulting in reduction of the incentive to invest.
3. Funds may be raised by collecting a certain percent of the certified emission reduction credits. The revenue from selling the credits will be used for meeting the costs of adaptation. This would mean a reduction of the credit the investor could receive. Although this option may discourage appetite for the investment, it might be rightful in light of the faithful interpretation of the Protocol.

Under the third option, the way to convert the credits into money may be another important issue. Should the credits be given to the country vulnerable to the adverse effects of climate change in the form of credit? Or should the organizations collecting the credits (e.g. operational entities) convert them in money in the emissions trading market to provide the fund for that purpose? In the latter case, it would be desirable that operational entities entrust the conversion to brokers, since they are more familiar with market trading.

The Protocol only states that the aim of the raised fund is to meet the costs of adaptation, while Article 4.8 and 4.9 of the Convention include not only funding, but also insurance and the transfer of technology to meet the specific needs of the relevant countries arising from the adverse effects of climate change. In this sense, besides providing funds, the adaptation measures including the implementation of the adaptation projects may also need to be addressed.

Considering the above points, it may be more practical for executive board (or COP/MOP) to manage the adaptation funds raised by operational entities and decide the eligible countries or projects for their use.

## **Use of the adaptation funding**

Regarding funds for adaptation measures, various uses may be feasible. These include,

- Adaptation Projects (including capacity-building, technology transfer);
- Insurance/Reinsurance;
- Trust the fund to GEF and utilize it for adaptation projects in vulnerable countries;
- Distribute credit among relevant countries;
- Provide cash for vulnerable countries;
- Reserve funds for disaster,

However, it requires an examination on the limit of the interpretation of the Protocol to decide whether funds from CDM can be used for this broad purposes .

Although the use for insurance/re-insurance has a merit of providing huge resources against potential catastrophic events, it limits the fund use to passive purposes and raises some doubt about satisfaction of the relevant developing countries. Furthermore, since distribution of credit or cash may lead to the problematic concept of 'compensation', considerable negotiation efforts will be needed to agree on the criteria of their distribution. Considering that implementation of adaptation measures is an issue of utmost priority for the relevant developing country Parties, prompt international agreement is desirable. Therefore one should avoid the choice of additional disputes at least at the initial stage of the mechanism.

Based on the above arguments, appropriate use of funds and the kinds of the targeted adaptation project activities require an urgent discussion, taking the needs of relevant countries into consideration. In this regard, a study or guidelines by IPCC or SBSTA would be highly useful.

## **VII. Means of lowering transaction costs**

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### **Importance of cost minimization**

With a declining allocation of ODA, limited financial resources of national governments, and the most relevant climate-friendly technologies owned by the private sector, it is expected that the major source of capital for CDM projects in the future should be the private sector. For private sector participants, project-based flexibility mechanisms such as JI and CDM may hold disadvantages compared with emissions trading, given the functions of emissions trading markets are equivalent to that of current financial markets. These disadvantages are generally associated with 1) high transaction costs in connection with projects, and 2) time-consuming procedures for project implementation. Experiences from AIJ identify high transaction costs involved in the project implementation as one of the major barriers to expanding project activities. In some cases, transaction costs which are almost as high as the costs of project implementation are reported. Therefore a key to a successful CDM will be how to lower the transaction costs. Of course, one cannot conclude that these transaction costs are particularly big barriers, because there are abundant cost-effective emissions reduction opportunities in non-Annex I countries, and investors make decisions based on the total emission reduction costs including both emission reduction costs and transaction costs.

However, as pointed out in AIJ Studies (Nordic Council 1998, JIN and SEVEN 1997, Aslam 1998), regulatory and institutional capacities of the host countries influence decisions about project implementation greatly. In this sense, it cannot be denied that investment appetite may be somewhat inclined to Art.6 JI in EITs, where investment infrastructure is relatively in more favorable condition than in most non-Annex I countries. Furthermore, a share of the proceeds from CER used to cover the cost of adaptation (Art.12.8) can also be a disincentive for Annex I countries.

Nevertheless, it is also true that there are ample excellent cost-effective emissions reduction opportunities in non-Annex I countries. Besides, investments in CDM projects will contribute to economic growth and sustainable development of developing countries through technology transfer. They will also have the secondary

benefits such as local environmental improvements and job creation. In either case, an important point in designing CDM ensuring adaptation funds is to carry out many projects securing environmental quality in a system with an acceptable level of transaction costs.

For the above reason as well as the cost efficiency concept of JI/CDM projects, it is important to keep the transaction costs -i.e. additional costs involved in JI and CDM projects compared to a corresponding project implemented domestically- to a minimum via the carefully-thought out institutional structure. Several AIJ studies define transaction costs as follows.

1. A general costs elements associated with bilateral projects including costs of project identification, evaluation and administration;
2. Costs associated with JI/CDM project including JI/CDM application, documentation, verification and crediting etc.

Reduction of the costs categorized in 1 is similar to the cost reduction effort for direct project costs. Options include,

- Project identification systems such as information centers and clearing houses;
- Standardization and simplification of administrative procedures;
- Streamline and divide work in modules which will result in shorter working hours/ lowering personnel costs,
- Centralized management of the insurance against risk involved in CDM projects.

Regarding costs in the category 2, possible options include,

- Standardization and simplification of approval procedure for CDM projects;
- The use of technological matrix guidelines for baseline-setting.

## **Utilization of existing institutions**

As a means to reduce the total project costs, it is desirable to use existing institutions. Some of the mechanisms and activities in various international institutions that can be made the best use of for CDM include below;

- Portfolio management of the projects in multilateral mutual funds can achieve risk diversification and total cost reduction of the related projects. In this sense, funds like the Prototype Carbon Fund advanced by the World Bank with its high expertise in the identification and evaluation of potential projects and in project management would be effective in gaining confidence of investors and attracting investors with relatively small capital.
- GEF's experience and expertise in identification, evaluation, selection and implementation of climate-related projects can provide valuable information in preparing a CDM project procedural manual. Also the shortening of project cycles by its implementing agencies and the GEF guidelines for stakeholder participation with comprehensive multiple-stakeholders consultation could be a useful reference for standardizing and simplifying procedures.
- Asia Development Bank is about to complete a research project (ALGAS) which identifies least cost GHG abatement options, develops portfolios of technical assistance projects and investment, and formulates national action plans for abatement of future GHGs. Such knowledge-base and accounting on the part of regional development banks complement risks and foster trust in the private sector, thus helping encourage climate-friendly investments. In order to use the result of the ALGAS project and for actual investments, regional development banks can set up a fund similar to the aforesaid Prototype Carbon Fund of the World Bank. This would cover broader CDM projects and enhance liquidity of the market, leading to a better function of the mechanism.
- A member of World Bank group, MIGA (Multilateral Investment Guarantee Agency) provides investment insurance and guarantees against country risks to encourage the flow of foreign direct investment to developing countries. MIGA could also provide centralized insurance to cover country risks associated with CDM projects. By using standardized procedural analysis and spreading the insurance risk among all CDM projects, cost reductions can be achieved which would favor lower premiums.
- UNEP/UNDP: Certification of emissions reduction-the role of operational entities- could be contracted to independent auditors or environmental NGOs. In such a case, UNDP's cooperation network with NGOs as well as GEF's Scientific and Technical Advisory Panel (STAP) under the coordination of UNEP may be used to evaluate and certify CDM projects.



However, each organization has its own shortcomings. For example, the World Bank's has shown an inclination towards financing conventional large-scale fossil fuel projects in its regular portfolio, and has few staff incentives for putting global environmental concerns on a par with traditional bank business. The GEF still has complicated and lengthy project cycles, in spite of some improvements. It is imperative that we should create a system which could overcome these criticisms, making the best use of experience and expertise at the same time.

## **VIII. Meeting the needs of host countries and investors**

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It will be necessary for the CDM to provide criteria for the projects that the host countries will prove willing to accept, as well as to offer a good incentive for Annex I nations to obtain credits from projects. It is important that CDM projects should not collide with local, regional and national priorities of the host countries in the development and environmental areas. At the same time, projects should provide opportunities for investors to obtain credits at lower cost.

There are various possibilities to meet the above requirements. Three potential forms of international co-ordination are as follows:

### **Bilateral arrangements**

In a bilateral case, the investor itself should realize various needs of the host country, and the contract will be made directly between them. There is always the possibility of the host country not approving the project. This is especially so, if the investor did not understand the needs of the host country. In this case, a project broker with substantial knowledge base regarding the needs of a host country could play an important role of identifying potential CDM projects, making a bridge between the requirements of the host and the investor. Private project brokers, as well as

international development organizations such as UNDP or ADB, may be suitable for this function. The main issue here is whether such a broker can identify potential CDM projects, while providing the investor with inexpensive credits at the same time.

## **Multilateral arrangements**

International organizations can line up a variety of projects, find investors and manage projects in a portfolio. On completing the project in question, they can distribute the obtained credits to the investors according to the investment ratio.

A good example of such an involvement is the funds like Prototype Carbon Fund (PCF) advocated by the World Bank. This type of approach makes it possible not only to reduce the risks associated with CDM projects but also to lower transaction costs of their management. International financial institutions are generally well experienced in project management, and use of such existing resources should be encouraged.

## **Clearing houses**

In addition to the international co-ordination methods mentioned above, information clearinghouses are effective in matching the needs of hosts and investors. An information network “CC:INFO” maintained by the UNFCCC Secretariat on the Internet collects information on GHG reduction technology both from the demand and the supply sides. Other examples of similar efforts initiated by some organizations include “GREEN TIE” of International Energy Agency (IEA), “ALGAS” of the Asian Development Bank (ADB), “US country study” of the US Department of Energy and “Green Aid” by the Ministry of International Trade and Industry (MITI), Japan. It seems likely that the successful operation of the CDM will entail these networks being brought together and used effectively for the development of actual CDM projects.

## **IX. Incentives for the private sector**

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### **Implications of the CDM in Annex I countries**

Investment in CDM projects from private funds as well as public will be a necessary condition for the expansion of the CDM. To accomplish this, domestic private entities in developed countries need to be faced with the incentive to invest in CDM projects. It is the governments of Annex I country parties, not private companies, that are responsible for the quantitative emission reduction targets set by the Kyoto protocol. However, CDM could not operate effectively without the active involvement of the private sector, which has abundant capital and the latest technologies. Therefore, the important issue here is to internalize incentives for private sector participation in the CDM mechanism. Hereafter, two cases will be considered: One where private companies can keep credits obtained from CDM projects, and the other where they transfer credits to governments.

### **Cases: Credits kept by the investors**

#### **Allocation of emissions allowances with the introduction of the domestic emissions trading system**

This method is most straightforward. Each private company will achieve its own allocated emission target using emission reduction units obtained through trading and certified emissions reductions from CDM projects. A private company would have an incentive to operate a CDM project if the cost per ton of carbon reduction by the CDM project is less than the one for its reduction in its own production cycle, or the price of units in emission trading.

#### **Future introduction of domestic emissions trading system**

In this case, two arrangements would be feasible. The first one is the credit banking system. If the government allows that private companies investing in CDM projects could bank the obtained credits until the first commitment period, the companies

would have a good incentive to invest, because they will be able to apply those credits for the achievement of their reduction targets in the future. The other arrangement is that the government would guarantee to provide extra allocations in the initial GHG emission allowances at the beginning of the first commitment period to companies which possess credits through CDM projects.

### **Incentive generated regardless of national quantitative reduction targets**

Private companies would have an indirect incentive to obtain CDM credits if they have a channel to the international credit trading markets, even if there is no domestic market.

## **Cases: Credits transferred to the government**

### **Tax cuts**

In the case where companies transfer credits to the government, the government could give them a tax break of, for instance, carbon tax, energy tax, and corporate tax. It is desirable that the rate of tax cut would be proportional to that of emissions reduction, not to the costs of obtaining credits. Enterprises may have an incentive to invest in a CDM project if the amount of tax reduction exceeds the costs of emissions reduction by the project.

### **Subsidization**

The Government could give priority to domestic enterprises investing in CDM projects when purchasing credits, and use them for its quantitative emission reduction target. In this case, the government would have to secure funds to buy the credits with an alternative source of funding. This can be done either by increasing taxes or by imposing a new tax. This option essentially would have a similar effect as the introduction of carbon tax, if the carbon tax were introduced to cover the funding.

## **Relaxing the level of regulation standard in a command and control approach**

Suppose that a direct regulative approach led to introduction of an energy conservation law that set an upper limit on the level of energy consumption per GDP. In this case, the upper limit of energy consumption level for each industry could be relaxed in proportion to the amount of credits obtained by CDM projects. However, it might be difficult to establish linkage between the acquired amount of credits and the benchmark of the level of energy conservation if the limit is described in a qualitative manner.

## **Application of voluntary agreement / commitment**

A good example of this is the climate challenge program in the US and the Keidanren voluntary action plan in Japan. There are two major forms for this system. One is where an action itself is voluntary but tied with an agreement with government, and the other without it. The former will lead to a certain limitation on GHG emissions of each enterprise or industry. In this case, domestic private companies will have an incentive to obtain credits, if the government promises that the credits from the CDM projects will be allowed as an option to achieve their emission reduction targets. Although there may be inconsistency between the units of emission reduction set as voluntary targets and the actual credits from the projects, the consistency can be maintained by establishing common criteria as to the conversion of each unit to total emissions. However, if an industry or a company sets a qualitative target, there may be some difficulties maintaining consistency.

The latter is where an enterprise will not have any legal responsibility for the achievement of its own reduction target. Even in this case, there is a possibility for establishing emission limits but in a more decentralized way. Namely, industrial federations like Keidanren of Japan may allocate the initial emission reduction assignments to individual companies and introduce the domestic emissions trading system. However, in this case also, it will be necessary to make some agreements between government and each company or industry sector, so as to maintain consistency between emission reduction units in the domestic market and those in an international market.

As the system options mentioned above are purely a domestic issue in developed countries, and they should be discussed separately from the CDM itself. It can be concluded that the discussion concerning domestic system arrangements is indispensable to activating the CDM.

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