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Criteria for Joint Implementation Under the Framework Convention on Climate Change

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Foreword

This report is an attempt to capture the essence of the discussion that took place at a closed workshop organized by The Woods Hole Research Center on 9-11 January 1994. The aim of the workshop was to advance debate on the concept of Joint Implementation introduced into the United Nations Framework Convention on Climate Change. This Convention, signed at the United Nations Conference on Environment and Development in June 1992, received the required number of ratifications on December 22, 1993 and will enter into force on March 21, 1994.

The issue of implementing jointly the abatement commitments in order to meet the objective contained in the Convention was discussed at considerable length at the Eighth Session of the Intergovernmental Negotiating Committee (INC 8) and will be central to the discussions at the Ninth Session of the INC due to begin in Geneva on February 7, 1994.

To review the draft Criteria on Joint Implementation prepared by the Secretariat and discuss a set of papers commissioned on the topic, members of the INC Bureau, several governmental and nongovernmental representatives were invited to the Workshop in their personal capacities. The Secretariat's paper on Criteria as revised and the papers commissioned for the Workshop are appended to this report.

Discussions at the Workshop were held in an atmosphere of cordiality and mutual respect and were facilitated by Professor Abram Chayes, Felix Frankfurter Professor of Law, Harvard Law School, and Dr. Kilaparti Ramakrishna, Senior Associate for International Environmental Law, The Woods Hole Research Center. Discussion ranged widely. The issues that received most discussion were: the implications of Joint Implementation in the near- and long-term; the global reduction necessary to meet the objective contained in the Convention; equal but differentiated responsibilities, credit versus recognition, and trial phase versus operational phase; the relevance of verification mechanisms; and the role of international agencies. The report is a summary of discussions and does not represent a consensus.

Financial support was received from the Bureau of Oceans and International Environmental and Scientific Affairs of the U.S. Department of State, the Ministry of Housing, Physical Planning and Environment of the Netherlands, and the Rockefeller Brothers Fund. All are gratefully acknowledged.

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Report of the Workshop

Over 165 States have signed the United Nations Framework Convention on Climate Change since the June 1992 "Earth Summit" at Rio. On December 22, 1993 the Convention received the required number of ratifications and will enter into force on March 21, 1994. In adopting the Convention and in its speedy ratification the international community recognized climate change as "a common concern of humankind" and agreed to forge a global strategy "to protect the climate system for present and future generations". The objective contained in art. 2 states:

> The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

One of the topics around which a considerable amount of governmental, intergovernmental and nongovernmental attention was focused prior to the adoption of the Convention and more recently at Session 8 of the Intergovernmental Negotiating Committee (INC) was the "Criteria for Joint Implementation" to meet the abatement commitments contained in the Convention. To help contribute to the debate and to its resolution in meeting the objective stated above, a small group of individuals were brought together at a Workshop during January 9-11, 1994. The papers contained in the Appendices were commissioned for the purpose of facilitating discussion and as background material. They are included in this volume for their wider availability. The INC Secretariat paper on "Criteria for Joint Implementation" was included as well for the purpose of ease of reference. The two key elements necessary to meet the objective contained in the Convention, in our view, are (i) the commitments made by the industrialized countries and their compliance with those commitments as can be reviewed internationally; and (ii) transfer to the developing countries of resources and technology necessary to enable them to do their share. Meeting these elements requires total compliance with all the various provisions of the Convention, which is a detailed, carefully negotiated package. We believe that the discussions on Joint Implementation will contribute to effective implementation of the Convention.

The term "Joint Implementation" is not defined anywhere in the Convention. As a concept it was introduced into the negotiations in 1991 by Norway and has had since then varying interpretations. It is alluded to in the Convention at several places but the most important reference to it was in Art. 4.2.a. which states:

> The developed country Parties and other Parties included in Annex I commit themselves specifically as provided for in the following:
>
> > a) Each of these Parties shall adopt national policies and take corresponding measures on the mitigation of climate change, by limiting its anthropogenic emissions of greenhouse gases and protecting and enhancing its greenhouse gas

sinks and reservoirs. These policies and measures will demonstrate that developed countries are taking the lead in modifying longer-term trends in anthropogenic emissions consistent with the objective of the Convention, recognizing that the return by the end of the present decade to earlier levels of anthropogenic emissions of carbon dioxide and other greenhouse gases not controlled by the Montreal Protocol would contribute to such modification, and taking into account the differences in these Parties' starting points and approaches, economic structures and resource bases, the need to maintain strong and sustainable economic growth, available technologies and other individual circumstances, as well as the need for equitable and appropriate contributions by each of these Parties to the global effort regarding that objective. These Parties may implement such policies and measures jointly with other Parties and may assist other Parties in contributing to the achievement of the objective of the Convention and, in particular, that of this subparagraph;

....

When this article is read in conjunction with the principle of cost effectiveness contained in art. 3.3. it is clear that the Parties to the Convention shall take into account that policies and measures to deal with climate change should be cost-effective in order to ensure global benefits at the lowest possible cost. In addition this article also enjoins the Parties to carry out the efforts to address climate change cooperatively by interested Parties. One of the vexing questions of interpretation of the Convention is whether the Convention precludes carrying out Joint Implementation between Annex I countries and others.

Discussions at the Workshop focused less on the actual interpretation of the language contained in the Convention. The approach adopted was to take the criteria contained in the document prepared by the INC Secretariat as a first step in stating the consensus of views and proceed to comment on how a credible system of Joint Implementation could be put in place. One of the resounding conclusions of the Workshop was that it will be necessary to mobilize as many strategies and resources as possible if progress towards stabilizing greenhouse gas concentrations in the atmosphere at acceptable levels is to be achieved. It has often been said that if properly structured, Joint Implementation can link environmental protection and development in a new, positive partnership that can mobilize a new set of financial resources to pay for both. The Workshop was also impressed with the notion of gaining experience by adopting a phased approach that will include an experimental phase.

Joint Implementation: A Phased Approach[1]

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1. Introduction

What is Joint Implementation (JI)? In the Framework Convention on Climate Change (FCCC) it is described as a mechanism for cooperation between parties to meet the objective of the convention. Important considerations in favor of the introduction of the concept of JI are:

1) JI schemes could stimulate development and technology cooperation through generating (often private company) resources that would otherwise not be mobilized for such purposes, and thus stimulate broader participation in abatement measures.

2) The financial and societal cost for greenhouse gas abatement measures varies strongly among the parties to the FCCC. Given the global nature of the problem, national boundaries should not be barriers for the identification and implementation of cost effective schemes.

Important reservations with regard to the introduction of the concept are:

1) The mechanism could be used by the developed countries to buy their way out of their obligation to take the lead in combating climate change. Ironically, JI could have the effect that the poorer countries with relatively low marginal costs for limiting emissions or enhancing sinks would be sponsored to adjust their pattern of development, while emissions in the richer countries would continue to grow.

2) At present, there exists considerable uncertainties with respect to a number of technical matters, such as measuring the net environmental effect of a JI project. However, these technical problems can probably be solved in due course (along with the findings of the IPCC and experiences gained with JI).

Still the concept of JI has survived the tough negotiation rounds of the Intergovernmental Negotiating Committee (INC). Actually, the concept helped to reach agreement about the FCCC. However, an important condition for this agreement was that the INC should develop "Criteria for Joint Implementation" for consideration by the first meeting of the Parties to the Convention (Conference of the Parties (CoP)).

This paper, however, focuses less on the actual interpretation of the language used in the Convention with respect to JI. Rather, it gives a sketch of the process towards developing a formal JI system. We recommend that JI be developed gradually over time. In the initial 10-20 years emphasis should be given on laying the foundation for international partnerships in JI, and the mobilization of new resources. Over time, along with the economic development in developing countries, more emphasis should be given to global cost effective strategies. This process is illustrated in figure I. A further explanation is presented in the following sections.

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[1] This paper is written for the International Workshop on Joint Implementation, to be held in Southampton, Bermuda, 9-11 January 1994. It proposes a phased introduction of Joint Implementation (JI). The proposal is based on ongoing research on JI over the last two years at the Institute for Environmental Studies. In particular, a joint study on the economic and legal aspects of Joint Implementation (produced in cooperation with the Institute of Social Studies Information Services, The Hague), is relevant. This study will be published in March 1994. As part of our studies, a large number of country delegations and NGO's have been interviewed. In addition, a series of (inter)national workshops, (tele)conferences and Round Table discussions with the business community were held.

2. Joint Implementation: a phased approach

With the considerations and reservations of the former section taken into account, this paper suggests the design of a formal JI system along three phases: a pilot phase, a dual commitment phase and tentatively, a trading phase (figure I). Every phase would be reviewed by the CoP and adjustments should be made as appropriate. A further explanation is given below.

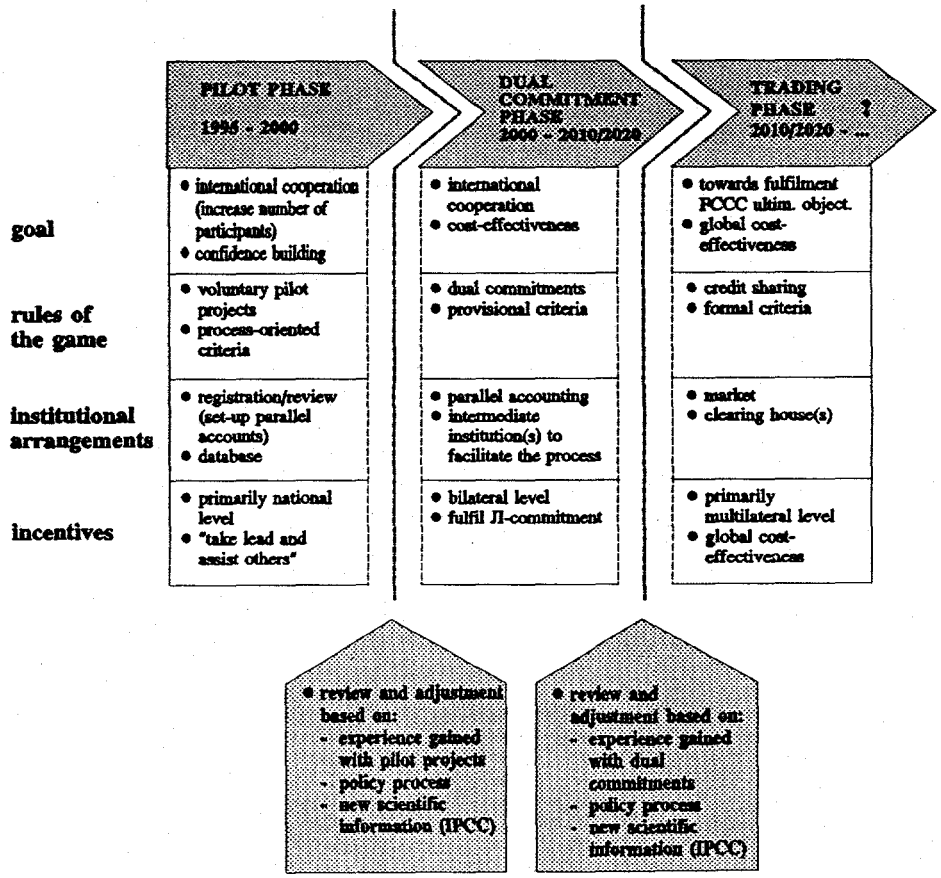
I. A system of JI should be designed and tested so that it can be formally introduced by the year 2000. The present intermediate period should be considered as a pilot phase, for the development of the formal rules and procedures.

For the current pilot phase, this has two consequences

a. emission reductions achieved abroad by JI activities should not be credited against the current (1990-2000) commitments of developed country (Annex I) Parties in the FCCC

Although the Framework Convention on Climate Change formally provides for JI[2], at present it seems unlikely that JI could play a significant role due to time constraints. Moreover, in the first instance, developed countries should focus on increasing the energy efficiency of their production and consumption patterns. So both for practical reasons (time) and reasons of principle we recommend that the commitments of developed country (Annex I) Parties to return their GHG emissions to 1990 levels by the year 2000 should be achieved with domestic policies and measures alone. Hence, JI should not contribute to the fulfillment of these objectives.

Figure I



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[2] Article 4.2(a) FCCC states that developed countries (Annex I) [italics added] "may implement [..] policies and measures *jointly with other Parties* and may assist other Parties in contributing to the achievement of the objective of the Convention and, in particular, that of this subparagraph...".

b. any JI project in the pilot phase should be considered as a voluntary effort, of which fruits can be reaped once the formal JI system enters into force. These efforts should be registered, reviewed and accepted by the international community through the CoP.

Information on the technicalities of JI is still lacking. Therefore, pilot projects should be encouraged to gain experience with JI.[3] Investments in pilot projects should be considered as a voluntary effort, involving no direct return on investment for the investing party.[4] However, these efforts should be registered along with the national reporting requirements in the Convention, although this reporting should clearly be separated from efforts and achievements on national territory (see below). In addition, these projects should be reviewed and accepted by the normal review mechanism of the Convention. The CoP should develop provisional methodologies for reporting and registration. The actual emission reductions achieved by pilot projects after the year 2000 (which are initiated before this year) should be taken into account annually, but only from the moment JI is formally agreed upon. Hence, the (total) emission reductions of pilot projects cannot be counted with retrospective effect. In brief, present investments in JI projects should be considered as an investment in the future.

II. At its first meeting, the Conference of the Parties should develop and agree on "process-criteria" rather than adopting final criteria.

The FCCC calls upon the CoP to adopt criteria for JI at its first meeting, to be held in 1995 (Art. 4.2.d FCCC). Although the language of the Convention suggests that the CoP should adopt a set of criteria before JI can be allowed (i.e. 'top down approach'), we recommend that the CoP develops JI through a 'bottom up' approach. In this approach, the CoP should propose a process, indicating the direction which the CoP believes JI should evolve. These provisional criteria (and 'ad-hoc criteria'), guidelines and methodologies, should be refined as experience is gained with pilot projects and the findings of the IPCC. Hence, the CoP should not set criteria in a formalistic way, but instead enhance process recommendations. "Learning by doing" is the key. For example, the CoP may decide to adopt the ad-hoc criterion that sinks projects can be registered and reviewed but not yet properly accounted for until methodologies for accounting the results of sink enhancement (IPCC) are refined. From the very outset, it is better to widen the range of experiences rather than to set too strict criteria. However, in due course the CoP should aim at adopting efficient and equitable criteria, which take account of environmental, economic and social concerns.[5]

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[3] Type of projects that could be pursued through Joint Implementation schemes could be characterized as indicated below:

Limiting emissions	-	energy	CO_2	-fuel switching -renewable energy sources -efficiency/conservation
	-	various sectors	CH_4	-various sources
Enhancing sinks	-	forestry	CO_2	-conservation of existing forests -rehabilitation of degraded forests -afforestation -sustainable management practices

[4] Some shortcomings of JI have as yet a technical character, to be addressed by the Intergovernmental Panel on Climate Change (IPCC). The IPCC is currently developing methodologies for measurement of the environmental effect and accounting procedures for specific sources and sinks. The outcome of these activities will be a valuable contribution to the design of the JI system. Pilot JI projects offer valuable opportunities to test these methodologies in real-life circumstances and contribute to the development of accounting procedures. Moreover, pilot JI projects should be encouraged to establish an empirical basis to contribute to the formulation of international criteria for JI (e.g., the U.S. initiative on Joint Implementation: Clinton and Gore 1993).

[5] for criteria and ad-hoc criteria see Kuik *et al.* 1993

III. All JI projects, including pilot projects, should be registered in a transparent "parallel accounting system", i.e. actions and results outside the national territory will be reported and registered separately from actions and results within the country. Both can be reported through national programs and reporting procedures.

The possibility of a reliable and standardized calculation of the results of a JI project is an essential condition for the credibility and transparency of a JI mechanism. The IPCC (Working Group I) is currently addressing accounting issues with regard to emissions of different sources and sinks of GHG.[6] Accounting for JI should of course conform to the general accounting principles and methodologies to be decided upon by the CoP. A feasible way of enhancing transparency is to report the adoption of policies and measures (and their effects) at home and abroad separately. The host country party should likewise report separately on any effort that has been made with the assistance of others. The results reported through different channels should be examined, reviewed and registered periodically. At the outset of a JI mechanism, there is no need for a large administrative body to monitor transactions. JI, accounted for in parallel accounts, can be reviewed by the normal review mechanism of the Convention.

VI. In the next round (after 2000), when JI is formalized, countries could indicate separately which emission reductions in % or in tonnage will be achieved by domestic policies and measures, and which by investments in projects abroad. Hence, dual commitments consist of a domestic commitment and a JI commitment.

Over time, along with the economic development in developing countries, further measures (in addition to the current commitments of developed countries to return their emissions to 1990 levels by the year 2000) to reduce GHG emissions are foreseen. However, in going beyond the stabilization of emissions at 1990 levels it will be increasingly difficult to establish the same commitments applicable to all developed countries. After all, there are basic differences (energy use, costs of GHG emission reductions, efforts in the past, per capita emissions etc.) between these countries.

Dual commitments could reflect the capacity of countries to undertake measures at home and abroad. In negotiating on future commitments, (from the first CoP), countries should indicate their 'domestic target' along with their 'JI target'. For example, countries may conclude a dual commitment for the year 2010 consisting of the domestic commitment to reduce their GHG emissions by x%, and the 'JI commitment' to achieve an additional amount of y tons reduction by means of investing in JI projects abroad. It is anticipated that the efforts within the boundaries of Annex I countries (x%) are considerably larger than efforts abroad (y tons). This approach is a response to the legitimate concern that the primary responsibility of industrialized countries is to undertake measures at home. An advantage of the "dual commitments" is that it avoids the international discussion on credit arrangements. It would also address the global warming problem in a global context; after all, controlling global emissions is the ultimate objective of the convention. Periodically, (as part of the FCCC reporting mechanism) the JI commitment will be compared with the actual achievement of this target, such as indicated in the JI account. The question whether reductions achieved abroad by means of JI projects may be used to offset the non-attainment of the domestic target will crucially depend upon the acceptance in the political process (CoP).

In order to achieve the ultimate objective of the Convention, over time, more emphasis should be given to global cost effective strategies. After one or two rounds of dual commitments, when considerable experience is gained, the international community may decide to put emphasis on global cost effectiveness. Flexibility is then the key, and hence, remaining constraints should be taken away. The locality of implementation of national commitments should crucially depend on cost-effectiveness, rather than a predetermined division of implementation of measures domestically and abroad (dual commitment). Investments in JI projects should be rewarded with real credits, rather than 'political credits'. In due course, when transactions with JI projects are standardized, these credits may be traded bilaterally or multilaterally.

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[6]Article 12 specifies the commitments of the parties with respect to the communication of information related to implementation. Each Annex I party is summoned to incorporate in its communication a description of the policies and measures that it has adopted to implement its commitment, and a specific estimate of the effects that these policies and measures will have on emissions.

3. Incentives to make it work

Incentives on the national level

JI projects are bilaterally negotiated between two, and possibly more, governments. The involvement of private companies should be encouraged by national governments. After all, it is primarily industries which are in possession of technologies, and can provide the financial resources. Moreover, the business community probably has a range of experiences and expertise in transborder business relations, and are abreast of the conditions prevailing in potential partner countries. However, full responsibility would remain with the respective governments, for the governments have agreed to the commitments in the FCCC. Governments should encourage the business community to cooperate firstly in identifying JI opportunities, secondly in taking on the JI projects as agreed upon by the governments, thirdly in investing in JI. During the pilot phase, governments will have to give strong incentives to industry to participate in projects, for investments in these projects are on a voluntary basis. There is a range of possible incentives the governments can give to their business community. For example, in order to encourage investments in JI projects, governments may conclude 'covenants' or issue national 'credits', i.e. exemption on other measures or taxes. However, such national incentives are primarily questions of national concern and responsibility.

Incentives on the international level

Recognizing the importance of gaining experience with JI, pilot projects should be encouraged. As JI efforts are as yet voluntary, i.e. involving no 'credits', other incentives should be given to invest in such pilot projects. In the FCCC, industrialized countries have expressed their willingness to 'take the lead' in tackling the global warming problem, and to 'assist others' in their contribution. In the international discussion (INC/CoP) it should be emphasized that investing in JI pilot projects can be considered as a form to give a meaning to these expressions (taking lead and assisting others), i.e. by paving the way for global cooperation to address GHG emission limitation. Moreover, countries may invest in JI pilot projects to anticipate that in the next round (after 2000, in the form of dual commitments) JI will actually exist. By experimenting with JI at present, countries can build confidence with respect to JI, and ensure a genuine spirit of global partnership. In this respect, it is also important to encourage dissemination on JI information, provide opportunities to research JI opportunities, and enhance the discussion on JI in general.

Incentives can also be given by intermediate institutions offering their services to facilitate JI activities. For example, the Annex I/II countries may decide to establish a platform of information exchange on potential JI projects, which may lower administrative "transaction" costs. Providing information on suitable JI projects to potential investors can be done by collecting information on relevant projects and by establishing a register, giving information on the type of projects, their origin, costs and expected abatement effects. In due course, when experience with JI is abundant, and transactions are more standardized (involving credits), it is conceivable that credits are traded multilaterally. A 'clearing house', bringing market demand and supply for JI projects or credits together, could give an incentive to this process. However, at any stage the assignment of a monopoly position to any of such institutions should be avoided.

Achieving Joint Benefits from Joint Implementation

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Joint Implementation (JI) appears to have been born with the Applied Energy Services Guatemala project in 1988. That project, to plant 52 million trees, protect existing forests from cutting and fire, and enhance rural development, is being implemented by CARE Guatemala to offset 120 per cent of the emissions of a small coal burning power plant that has been built in Connecticut. Since that time, several utilities and governments have initiated additional projects. Not all of these necessarily consist of tree planting in other countries, but may consist of energy efficiency or energy conservation programs designed to reduce carbon emissions by at least as much as the additional releases from a new facility. All JI projects share the characteristic of linking the release of greenhouse gases in an industrial country with an offset that reduces or absorbs a comparable amount in another country. The emitter in the industrial country is willing to pay for the reduction elsewhere because costs are less than they would be at home.

Advantages and Disadvantages of Joint Implementation

The principle advantages claimed for JI strategies are:

1. They establish a direct link between new greenhouse gas emissions in one location and reductions or offsets elsewhere;
2. They provide flexibility to negotiate reductions that exceed the amount of new emissions;
3. They can lead to greater greenhouse gas reductions for a given cost; because offsets in developing countries or Eastern Europe are less expensive than prevention or mitigation within an industrial country;
4. They have the capacity to mobilize additional development funds from the private sector, utilities and governments for forestry, energy and other development projects in developing countries;
5. They provide flexibility since projects need not wait for treaty making, negotiations or changes in the structure of development assistance or lending programs and thus encourage innovative approaches;
6. They can be implemented more rapidly than projects undertaken by traditional development assistance or GEF programs; and
7. Joint Implementation projects are the only examples of greenhouse gas reduction actually undertaken to date.

The major criticisms of JI strategies appear to be that:

1. They permit industrial nations to "solve" their greenhouse problem by imposing solutions on developing countries rather than by reducing their own emissions of greenhouse gases;
2. JI is unfair to developing countries which cannot find similar inexpensive approaches;
3. It is difficult to account for greenhouse gas reductions over the life of the project especially for energy efficiency and forest protection projects;
4. There is disagreement as to who should receive credit for greenhouse gas projected emissions from the new source reductions accomplished through Joint Implementation; and
5. There is little accountability to governments or international regimes when the private sector is the source or recipient of funds.

In the following discussion, we will explore strategies that address the objections and suggest ways in which it might be possible for considerable economic benefits to flow to the South and Eastern Europe from new sources if an acceptable regime for JI can be established.

Approaches to Joint Implementation

First, let us summarize the types of projects that are being considered for Joint Implementation, and the technical requirements that must be incorporated into any JI project. First and foremost, any offset strategy should be

designed to absorb or reduce a specific greenhouse gas by at least as much as the full emissions of the new source. Because not all greenhouse gases released end up directly in the atmosphere, there is a temptation to only offset that fraction that reaches the atmosphere. It is important to recognize that those gases not appearing in the atmosphere are in fact contributing to the saturation of some other reservoir, and hence need to be fully accounted for. Fortunately, all projects currently under way or proposed offset the full releases of greenhouse gases. Second, it is desirable to require offsets that exceed actual new emissions for three reasons. The most obvious is that it is desirable to begin reducing net additions of greenhouse gases into the atmosphere rather than simply maintaining the status quo. Second, there are and will be uncompensated increases in greenhouse gases as the South industrializes and as the North reindustrializes that can be partially offset by increased requirements in JI projects. And finally, there is often uncertainty about the exact amount of greenhouse gas offset in a newly planted forest or energy conservation program, and requiring an additional offset provides some insurance against failure to meet the desired goal.

Tree planting to absorb a specific amount of carbon dioxide represents the first and best known example of a joint implementation strategy. However, merely growing trees for the purpose of absorbing carbon dioxide often fails to meet the development needs of the country in which they have been planted. Joint Implementation projects of this kind need to meet a wide range of development goals from fuels and agroforestry to building materials, soil improvement and erosion control. Other goals may be to enhance biodiversity, reestablish native forests and other ecosystems, increase soil carbon and protect existing forests from fire and cutting. It is important to remember that while there is the potential for thousands of such projects in the world, that afforestation and reforestation projects are ultimately limited in the amount of carbon dioxide they can absorb because of land availability. They should be viewed as a useful complimentary strategy.

A second type of Joint Implementation project involves assistance to newly industrializing or reindustrializing countries to improve energy efficiency or introduce technology that releases little or no greenhouse gases. This strategy can provide an important path for significantly expanding technology transfer to developing countries and Eastern Europe. In order to actually realize greenhouse gas reductions, the new technology should both expand energy supply in the recipient country and replace existing inefficient technologies.

A third type of JI project that has not been considered thus far is reducing the release of greenhouse gases from industrial processes, landfills, sewage treatment facilities and agricultural practices. This approach also represents a form of technology transfer, and can provide assistance to developing countries by providing improved sanitation, enhanced industrial processes and additional sources of methane fuel for industrial or small scale electric power generation.

At a time when official development assistance funds are no longer expanding within the industrialized nations, there is a clear advantage to mobilizing additional financial and technological resources from utilities, industries and governments in the North to further development goals in the South. At the same time, a successful JI regime can slow the growth in greenhouse gases in the atmosphere. To meet these desirable objectives, however, will require that nations address the objections that have been raised to Joint Implementation.

Recommendations

The two most difficult issues seem to be the concern that inexpensive JI options reduce the incentive and pressure on industrial countries to reduce their greenhouse gas emissions, and which nation receives credit for greenhouse gas reductions under Joint Implementation.

One way to address the first of these concerns is to require that those who wish to undertake a Joint Implementation project be required to commit to actual reductions of greenhouse gases in their own country. In the most stringent regime, these emission reductions would have to be achieved before a JI project could be approved. A more flexible approach would permit JI projects to move ahead, but that credit for reductions from the JI project would only be counted as the reductions are accomplished in the industrial country. The amount of reduction required can be equal to that which is claimed under JI or some negotiated quantity that might be either more or less than the actual accomplished reduction. Whether this negotiation could be among the partners in the JI project or would require the intervention of governments, parties to the Climate Convention or the UN needs to be decided. To retain the advantage of flexibility and speed, it is recommended that the JI partners

be able to negotiate under a set of guidelines approved by the parties. Under this scheme, utilities like those in California that have pledged to reduce carbon dioxide emissions by 20 per cent would be eligible for a comparable amount of credit for JI projects once those emission reductions have been achieved.

This still leaves open the question of which nation receives credit for reductions under JI. Clearly, no private source of funding will be mobilized unless it receives emission reduction credit. Each industrialized nation will need to develop its own internal allocation or tradable permit scheme for allocating within the country among industries, utilities and other emitters. Since in most cases, JI is several times less expensive than actual reduction by the emitter, it might still be attractive either to require a larger offset in the developing country or else an increase in the size of the actual reduction in the industrial country that is needed to qualify for JI credit. To encourage private parties to participate, it will be necessary to retain a significant cost saving for JI relative to reduction or mitigation by the emitter in the industrial nation. An alternative is for the paying country and the host country of the JI project to split the credit between them according to a negotiated formula.

Finally, it is necessary to have a certification scheme for JI agreements in order to determine which ones count toward meeting national emission goals under the Climate Convention. This need for certification is even more important if there are additional conditions or proportional or fractional credits involved. As indicated above, in order for JI projects to receive credit, some standardization of counting for particular kinds of projects such as forest protection or end use efficient technology need to be introduced. The same agency that will receive and tabulate the reports specified under the Convention could also verify completion of the greenhouse gas reduction program by an emitting company or utility prior to granting JI credit were that requirement adopted. For credibility purposes, an independent agency needs to develop a secretariat for conducting this certifying function. Having a public certifying mechanism will assure a degree of accountability to the international governance community and to the parties to the Climate Convention.

These recommendations for a viable Joint Implementation regime attempt to address the concerns of both industrial and developing countries as they try to control the rise in greenhouse gas emissions in the atmosphere. An attempt has been made to retain as much of the flexibility and opportunity for creative solutions that has characterized the few JI projects that have been implemented and proposed so far. In assuring some degree of accountability, one must be careful not to discourage new approaches or slow their implementation by cumbersome rules and detailed requirements. It is recommended that there always be room for experimentation and opportunities for unilateral action that can reduce net additions of greenhouse gases to the atmosphere. In that spirit present projects, if judged to be effective, should be counted under any set of future rules that might be established. An assurance to that effect by the parties to the Convention would encourage the development of additional JI options, and accelerate the slowing of greenhouse gas releases.

Despite the best efforts of this analysis to respond to criticism and concerns about JI, some nations may still choose not to participate. It is important to remember that like Debt-for-Nature swaps, no nation is required to accept a JI project. Given that the Climate Convention does not even require nations to adopt reductions at this time, it is encouraging that governments and the private sector have already begun to reduce greenhouse gases through Joint Implementation projects. This suggests that JI represents a potentially effective strategy for slowing the release of greenhouse gases. Those who wish to proceed by this approach should be encouraged to do so, but no nation need be required to participate.

It is clear that it will be necessary to mobilize as many strategies and resources as possible if progress towards stabilizing greenhouse gas concentrations in the atmosphere at acceptable levels are to be achieved. Joint Implementation, if properly structured, can link environmental protection and development in a new, positive partnership and simultaneously mobilize a new set of financial resources to pay for both.

Role of Markets, Governments and International Bodies in Joint Implementation with the South

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1. Introduction

Joint Implementation (JI) opens up 'markets' for carbon emission reduction projects of all cost categories spread throughout the World. Projects commissioned in the developing countries by the Global Environment Facility (GEF) suggest that the cost of CO_2 emissions reductions ranged from US 20 cents per tonne to $ 42 per tonne on the basis of incremental costs. These costs are much lower than those indicated in the literature referring to the costs in the industrial countries (IC). Even if the costs are similar, the markets for cheaper credits will be widened by the inclusion of more countries. Thus, JI requires a thorough analysis as it could serve as a potential vehicle to reduce greenhouse gas (GHG) emissions in a cost effective manner. What is also important is that JI will initiate a catalytic process in the developing countries (DC) through the demonstration process. Tangible and intangible benefits of JI are:

- Cost effective opportunities for the North.
- Reduction in the emissions by the DC without compromising development options.
- Capacity building in the decision making process in the DC due to increased awareness of the climate change problem among not only the people around the project but elsewhere due to learning and dissemination process.
- Consciousness for the new investments which could put DC on low GHG paths.

Increased emissions in the DC are generally considered inevitable but the extent of this increase can be controlled through JI, through technology transfers and financial transfers from the IC to DC.

This paper considers the role of Governments in the DC and IC as well as those of international bodies such as the Conference of Parties (CoP) and the Secretariat of the Framework Convention on Climate Change (FCCC) to develop and service JI.

2. Hierarchy of Criteria for Joint Implementation (JI)

2.1 Main Criteria of JI are the objectives of FCCC:

Principle criteria for JI will be to serve to the objectives of FCCC.

Objectives of FCCC (Art. 2) deal with

- Stabilization of GHG concentrations
- Avoiding risk to food production systems
- Sustainable economic development

Within these overall objectives there will be considerations that deal with interests of each party as well as those relating to JI and monitoring. These should form part of the criteria to be discussed at the INC.

2.2 Criteria for the Annex I Countries:

Although, FCCC objectives do not include cost effectiveness as a criteria, cost effectiveness is mentioned at

several other places in the FCCC. In addition to cost effectiveness, the INC or CoP may wish to decide what portion of commitments could be met with JI. This is an issue on which political agreement is needed.

2.3 Criteria for Developing Countries:

Care should be taken to see that developing countries do not get saddled with the burden of JI projects, under the guise of cost effectiveness meant for the industrial countries. But, JI projects should be formulated to serve other commitments mentioned in the convention such as eradication of poverty and sustainable development.

It is not enough that JI projects be not harmful; they should not even be unrelated to the priorities of developing countries. Projects that are harmless but unrelated to development priorities divert attention and scarce skills away from priority areas and thus have high opportunity costs for developing countries. When a project is directly related to their own priorities, it ensures the enthusiastic participation of developing countries and, therefore, also its success. Reducing future increase in emissions in the developing countries help small island states, and coastal zones of all countries in the future.

2.4 Criteria of Accountability of Net Emissions Reduction:

It would be desirable to go for those areas in which emission reductions could be clearly accounted for. For example, mainly those areas which relate to emission reduction - rather than enhancing sinks - as explained later so that there is global accounting of reduction taking place in space and in time. Global accounting of emission reduction involved in JI at different places will have to be done to ensure that there is a net reduction considering emissions in each territory. What is the emission reduction in each year and until when, would have to be spelled out.

3. Joint Implementation (JI): Economic Interpretation of the Transactions

For an industrial country, there is a cost involved in discharging its GHG reduction obligations. When one talks about JI in developing countries being "cost-effective", one is implying that industrial countries acquire something that would be "otherwise expensive" in their own country. The cost incurred in a JI project is in lieu of the GHG-reduction credit. We call this the cost of carbon credit. This cost can take any form. It could be direct foreign investment or North-South transfer or any other mechanism. However, as long as an industrial country wishes to have carbon credit, this is a transaction involving market exchange, a trade. Joint Implementation could be viewed as trade in carbon credits or direct foreign investment rewarded in terms of carbon credits. This is explained further in Appendix A. Trade is an instrument from which both the parties benefit from their respective comparative advantages.

Proposals to give assistance and keep separate records at home and abroad also come into this category if at any time offsets or concessions are sought for reductions at home against reductions abroad. It is no longer assistance without returns and three issues emerge.

- Do developing countries who participate to make the reductions cost-effective get a fair deal?

- When carbon credits accumulate with industrial countries through JI projects, they appreciate in value with time, assuming that as time goes on the reductions become more expensive. How does one share these benefits of value appreciation?

- If reductions in emissions abroad are substituted for emission reductions at home, what happens to global accounts of emissions and distributions? This may be the worst option.

These issues are discussed below:

4. JI for DC Now and not in 2000

4.1 Advantages of Earlier JI:

If developing countries reduce more and earlier, the benefits are substantial over the lifetime of energy efficiency

programs and equipment. It is possible to stimulate greater carbon reduction with adequate investment and effort. This would bring developing countries to low GHG paths faster and sooner. The analogy of reducing births to control population comes to mind where faster and earlier birth control could reduce global population from 15 billion to 8 billion or less in the year 2100.[1]

If this is not done, the gains made by industrial countries in reducing carbon emissions will be wiped out at a faster rate by developing countries. It is fallaciously argued by some, that through JI developing countries will get paid for their energy efficiency programs which they would have carried out anyway, and world GHG levels will not go down. These arguments assume a fixed supply of carbon reduction possibility every year due to energy efficiency programs not only in quantity but also in time. Analysis for India and other countries has shown that progress in the area of energy conservation measures is rather slow despite the large potential. Addressing this issue with vigor will yield more benefits to all parties and to the global environment. Waiting until 2000 for permitting JI with DC will be too late. For example, Thailand expects that their emissions will triple by 2006 (Surapong Chirarattananong and Bandit Limmeechokchai, 1993). Parikh J. and Majumdar S. (1993) find that by the year 2010 fossil-fuel related emissions in India may rise to 533 million tonnes of carbon equivalent (mtc) for 168 mtc in 1990.

Thus, at least a portion of this doubling could be avoided and the process of putting developing countries on a low GHG path can be initiated. JI could have a very high impact as a demonstration process that brings in other investments which are CO_2 efficient. Capacity building will also take place.

5. Priorities for Projects for Joint Implementation

FCCC stresses the need for sustainable development and compatibility with development priorities. Therefore, it is advisable to begin JI cautiously. At first, those areas should be considered where both parties are certain to benefit, that is, "no-regret" projects. In principle, carbon reductions will be won by controlling emission sources or by enhancing carbon sinks.

5.1 Projects to Reduce Carbon Emissions through Increased Efficiencies:

Those projects which are on the current list of priorities of developing countries in the area of energy are the best or no-regret options, viz.

(1) Reduction of carbon emission by saving imported oil or electricity through improved and efficient technologies, which are investment - and import - intensive. All countries use oil and electricity. Therefore, this would be of interest to all developing countries. Even oil rich countries could export more, if they use oil efficiently.

(2) Investment in reducing losses in power supply system or modernizing them to make them more efficient.

(3) Conservation projects for fossil fuel resources such as coal and gas which are used mainly when they are available domestically.

(4) Reduction of methane emissions from gas flaring, gas pipeline leakages and, leakages from coal mines.

(5) Reducing or harvesting methane emissions from sewage and wastewater. Improving ruminant digestion of the livestock to reduce methane.

(6) Projects which reduce biomass burning by providing or developing efficient cooking stoves, brick kilns or charcoal kilns; or by providing or developing clean fuels such as biogas; or by providing kerosene.

The list of projects can be enlarged to include less carbon-intensive technologies for transport, construction, industries and agriculture as well. For example, a project could propose assistance in mass transit systems such

[1] This analogy is only meant to indicate the dangers of delay and not to suggest reducing emissions in a similar manner as population growth.

as railways or suburban transport because private transport - serving as it does, only a chosen few - is not a sustainable solution, given the large population of developing countries. Carbon reductions from mass transit systems could be large over the long term; and investments in mass transit also would reduce congestion, fuel consumption and air pollution.

Joint implementation projects to reduce emissions from given activities by increasing efficiencies should have priority over enhancing sinks because:

- there may be a problem of calculation of credits for sink projects. Often, sink projects only postpone the problems, they do not solve it.

- there are problems of uncertainty and asymmetric information related to sink projects.

- there are no conflicts with development priorities. [through the "no-regret" (absence of conflicts with development priorities) nature of the efficiency projects]. An example of a project in Guatemala described later also highlights the difficulties.

Though there is a need to preserve forests, this may be best done by the countries themselves. Moreover, the Biodiversity Convention is a more suitable convention where complexities of forest ecosystems may be valued appropriately, rather than by treating them merely as carbon sinks. Since the GEF looks after all these conventions, these projects could be handled in a professional manner by them. There is a general impression that investing in forests will lead to greener world so let us rush to it; in reality it could lead to more conflicts as is shown by J. Parikh (1993).

Carbon credits will be fairly priced only when the savings in costs are shared by industrial countries more than equally with developing countries. It could not be on the basis of incremental costs, which deprives developing countries of a fair share of the savings.

Incremental costs is that which is required to change over from conventional technology to carbon-reducing technologies. This is generally high for the developed countries where already energy efficient technologies are used and labor is expensive. This is plotted against quantity of carbon reductions "purchased" in developing countries. The figure argues in favor of receiving equilibrium price which shares the benefits among carbon reduction supplier with the purchaser. In the case of incremental costs all savings accrue entirely to the industrial countries. (i.e., consumer's as well as the producer's surplus. This is explained in Figure 1).

Reductions due to policies - such as increased energy prices -should accrue to the people of the host countries who follow such policies and suffer the consequences of high cost energy.

It is clear that we are dealing with markedly different capacities to negotiate and implement global strategies. Unless a capacity building exercise is put underway and has made reasonable progress, DC could bind themselves on certain development paths chosen by IC. An experimental phase could look into various aspects of JI projects to decide

- what constitutes a JI project?

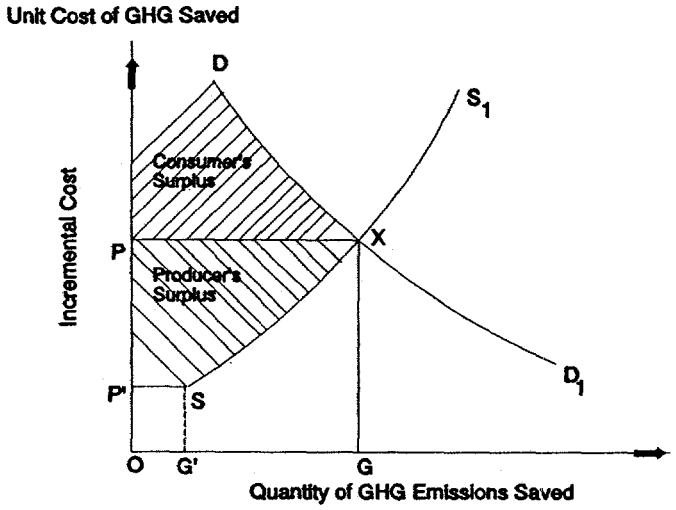
- how to share responsibilities of carbon reduction, human efforts, investment and technology development?

- do some of them indeed conform to the development priorities of developing countries or do they saddle them with new responsibilities to suit consumption patterns of the rich?

Some of these questions need to be looked into for every existing and future JI project before reaching political agreements.

6. How to approach Joint Implementation?

Figure 1: Sharing Fairly the Gains from Joint Implementation



A logically clean way to look at joint implementation is to think of it as a market exchange or transaction. In the figure SS_1 is the cost curve of developing countries to supply GHG saving options. The demand curve DD_1 shows what the industrial countries need to pay for GHG remissions.

Obviously, the intersection X gives the market clearing price, P and quantity traded, G.

At X, demand equals supply. OG amount of emissions would be traded at price OP. The shaded area representing producer surplus is gains to developing countries and area denoting consumer surplus is gains accruing to industrial countries. In simple words, this means that through joint implementation both developing countries and industrial countries gain. Industrial countries pay less than what it would have cost them to reduce as much GHG emissions (consumer surplus) and developing countries gain more than what it costs them (producer surplus) to do so. JI should give more than just fuel incremental costs given by GEF which only gives price at P' rather than X. However, due to this, carbon reduction will be also less at G' and will not reach G.

6.1 Joint Implementation in a Market oriented system:

Even though climate change negotiations are between the Governments, it is essential that JI should be kept in the market oriented system as much as possible so that it thrives on its own. While some Government to Government aid-oriented approaches could be permitted, major initiatives should come from the market system. The market system sustains itself without artificial props and provides checks and balances. However, some push in the form of policy measures would have to come from the Government. This could be in terms of carbon tax in the North with a possibility of rebate for JI as explained later.

Recently, many developing countries have prepared country case studies either under the environmental action plans or for the climate change convention for bodies such as World Bank, the regional development Banks, UNEP, UNDP, the GEF and so on. Based on this analytical work, the developing countries could indicate their preferences and priorities for the areas along with estimated cost per tonne of CO_2 saved. Needless to say that these are only benchmark costs. Final costs can be judged only after the project is formulated. Private companies in the North could look at these proposals and choose the country of their interest and project of their interest. Thus, the secretariat can provide such a data bank and serve as a clearing house. If and when credits for CO_2 emissions are desired by the Annex I countries, more work will be needed to look into a number of possibilities to avoid double counting, to monitor the project for CO_2 emission reduction and to develop credit accounting procedure etc. The Secretariat can declare different areas open as and when basic work relating to different areas is complete. A possible institutional mechanism is suggested below involving roles of national government and international bodies:

6.2 Role of National Governments and International Bodies: A Possible Institutional Mechanism:

JI would require the respective governments and international bodies lay down the guidelines, rules, and proce-

dures in order to develop markets, service and monitor for JI. While private parties may negotiate among themselves, JI would require some institutional mechanisms at national level that would be needed to register, endorse and monitor Joint Implementation. Because finally, all JI will have to show up in the national totals.

Internationally, an institutional mechanism will be needed in the form of a Council with experts and Government representatives from the South and the North. It would need administrative and policy support from the Climate Change Secretariat. We shall call this institution "the Council" for want of a better name.

While the Council can formulate policy, it may require policy approval from the Conference of Parties (COP). The Council can develop guidelines and procedures for working out the modalities for JI. Overall control would be with the Council (where members could serve for say up to 5 years unless nominated again). In addition, ad hoc technical committees could be set up to go into details of each specific area. This would be a one-time effort to set up guidelines for each specific area. These areas could be efficiency in power system, gas flaring or leakages and so on. These committees will lay down technical ground rules for estimating CO_2 reduction in each case. JI would have to be restricted to these areas. Power system is one of the most transparent areas in which emissions reductions can be quantified. It is relatively less complex and more easily measurable. The data records for the past are normally available in great detail in case of power system. Such past data can provide reference points against which savings can be measured. Technical work for laying down procedures for this and other areas will have to begin in advance. As and when demands for JI increases for new areas, new ground rules can be made by forming a relevant technical committee at the same following overall guidelines laid by the Council. Recommendation of technical committees can be put up for discussion and approval of the Council. Certified auditors could ensure that JI projects are carrying on as they are expected. Their annual certificates will be essential to claim the credit. Their credentials will be approved by the Council or Climate Change Secretariat.

7. Bidding Process: A Simplification

Another way to approach JI will be by announcing a price for which bids could be invited. Considering the inadequate capacity of developing countries to negotiate even through market oriented trade, FCCC may think of setting a minimum price per tonne of carbon saved. Those who wish can bid for it. This price can be updated every year or two years. This may limit the projects to only these cost categories, but that may in fact, serve two purposes: the North will undertake measures at home below this price. If the South bids for it, at least the project will be in their own interest. It is the South which will have to go through a learning process for which technical assistance could be provided. This is an arrangement where payments linked to the global price of carbon may have to be negotiated, as is done in some of the oil deals.

In order to discourage schemes such as the Guatemala project, a fixed (base not ceiling) amount of compensation should be declared - say $10/tonne. All schemes cheaper than this should be done first in the IC by the countries themselves. When projects in DC are cheaper than this amount, say $2/tonne, the remaining amount of $8/tonne should be spent in the upliftment of the community or workers participating in the project, say for schools, hospitals, sanitation schemes, libraries and any other community-oriented projects. Alternatively, this money could be simply distributed among the community or workers. Since carbon will be reduced every year, they should get that amount every year, thus ensuring the continued success of the project.

Since IC have to pay for reducing this carbon, they will refrain from exaggerating their claims and there will be self-enforcing verification (unless $10/tonne is underpriced and both parties DC and IC collude to exaggerate the claims at the cost of the environment). This could be also considered a bidding process.

8. Financing JI Schemes through Market Mechanism

How to raise additional funds when IC complain about paucity of funds even for the GEF? How to bring in fresh and additional funds? As clarified earlier, JI is in lieu of another obligation and it should not be seen as a substitute to contributions to the GEF, which is also supposed to bring new and additional funds over and above the development aid as mentioned in the FCCC. In order to bring about the required carbon emission reduction, IC may have to levy a carbon tax. Tax breaks could be offered to those private enterprises, who carry out JI in DC. Since the purpose of the carbon tax is not to generate revenue to balance budgets but to discourage the carbon emissions, governments in IC would be free to grant tax rebates for the JI projects to private enterprises corre-

sponding to the carbon emissions saved in DC. Firstly, this tax liability could be reduced by the enterprises by reducing carbon emissions in their own countries. Secondly, even this reduced liability could be reduced further through JI projects in DC.

What about individuals who wish to reduce carbon tax on their fuel consumption in households and personal transport? Carbon reducing enterprises could be set up that undertake JI projects in DC along the similar lines as is done by energy service companies which have come up recently in the USA. These companies manage energy conservation projects on the sites of industrial and commercial premises and get paid on the basis of energy bills reduced. The share holders of these carbon reducing enterprises could benefit from the tax rebates. These individuals can contribute to these and receive tax rebates in proportion to the carbon saved by these companies.

9. Link Between JI and Commitments

JI and extent of commitments are closely interlinked. If the commitments are high, more JI will be necessary to meet the levels of emissions reduction. If, however, the commitments are too low, JI would be postponed. Apart from extent of reduction the manner of reduction is also an important issue. For example, percentage reduction principle distributes the burden fairly and equitably even among the industrial countries compared to the goal of reverting to 1990 levels.

The draft paper on Joint Implementation (JI) to be discussed at the INC in August 1993 in a single phrase introduces three new concepts and principles which need to be discussed first, before adopting them. When the paper talks about "jointly returning to 1990 levels of greenhouse gas emissions". Four major issues emerge:

9.1 Grand Fathering:

The main difficulty is about the goal of reverting to "1990 levels". It introduces the principle of "Grand fathering". That is, those who have had high emissions in the past need only to go back to those high levels and this establishes their right to higher emissions. This is a major issue and needs to be debated. Furthermore, in the FCCC, differentiated responsibilities are mentioned. These need to be clearly expressed in terms of per capita emissions because even within the Annex I countries, some countries enjoy differentiated life styles compared to others. They ought to have, therefore, "differentiated responsibilities" as agreed in the FCCC. Those Annex I countries who emit more per capita emissions should have higher responsibilities. This would be the first time the INC will establish this principle and debate is necessary on this issue. If the principle of reverting "1990 levels" is accepted several decades later developing countries will also be asked to revert to the levels of 2010 and so on. This would be unfair to those who have been less profligate in the past. Those who have occupied more environmental space due to higher historic emissions should have higher responsibilities and therefore larger obligations.

9.2 What if 1990 Levels are Lower?

Another problem with taking 1990 levels as a goal is the underlying assumption that 1990 levels are always lower than 1993 which may not be true. As shown in Table 1, the emissions of Annex I countries are fluctuating and many countries have steadily declining emissions even since 1980 e.g. France. Therefore, reverting to 1990 levels, 1980 levels, etc. does not address the global environmental problem. For example, countries in Western Europe had emissions in 1980 higher than 1988. If one were to decide to "go back" to 1980 emissions should they increase their emissions? "1990 levels" is no goal at all. There are some who could do better than "going back to 1990 levels" for the same cost. The goals should be such that they should be encouraged to do so. Thus, the goal of reaching 1990 levels could be economically inefficient and environmentally inadequate (if not absurd).

9.3 Emission Reduction Commitment in Percentage Terms:

Rather than fixing targets in terms of past emissions levels, it may be more desirable to fix targets in terms of fixed **percentage reduction** in terms of average per capita emissions of the decade. This way, there would be eventually equity at least among Annex I countries to start with.

Table 1
COMPARISON OF 1980 EMISSION LEVELS WITH 1989

Countries	Total Emissions (million metric tons)		Per capita Metric Tons	
	1989	1980	1989	1980
United States of America*	1328.9	1259.3	5.37	5.53
USSR	1038.2	895.5	3.62	3.37
Canada	124.3	115.8	4.73	4.82
Czechoslovakia*	61.8	66.1	3.95	4.32
France*	97.5	132.1	1.74	2.45
Federal Republic of Germany*	175.1	208.0	2.86	3.38
Poland*	120.3	125.4	3.15	3.53
United Kingdom*	155.1	160.6	2.70	2.83

Source: CDIAC(1991)

* Six countries have higher emissions in 1980 than in 1989.

Figures for emission levels for 1993 are not available. However, one strongly suspects that the above argument will hold for the comparison of 1990 emission levels and 1993 levels as well.

10. Concluding Remarks

IC should view JI as an opportunity to

- induce capacity building which generates awareness in DC and CIET enabling them to shift to different development paths which reduces emissions.
- slow down the increase in emissions of DC and CIET. This will reduce pressure on IC and give them breathing space to restructure their economies.
- carry out confidence-building exercises necessary for partnership which will be required for many decades of collaboration necessary for this endeavor.

JI could pave the way to enormous demand in energy efficient equipment, strengthen cooperation through technology development and technology transfer. It could increase jobs in industrial countries and reduce fuel needs of developing countries while serving global environment objectives.

Having given the positive aspects, one must also admit that if JI is inappropriately defined or conceived, there are some serious questions that may arise later and DC may find themselves bound to carry out projects with little benefits and without adequate compensation. For this, the article suggests some simple schemes which are self-verifiable (partially).

It is possible to sustain JI through market mechanism and through carbon tax in the DC. However, active roles of governments and international bodies are essential.

An experimental phase for JI projects could be initiated in several areas to reduce emissions in DC. Projects that bring about systemic changes to reduce fossil fuels can be mutually beneficial. Existing JI projects also could be analyzed to see what lessons can be learned from them. It is yet unclear how to account for carbon reduction and a number of alternative schemes need to be analyzed before an understanding can be reached. After this experimental phase, and completion of reviews, JI could be formalized by INC. However, INC may agree to initiate an experimental phase.

Initial phase of JI, which will not involve carbon credits appears to be outside of international negotiations but it is a phase preparatory to the subsequent phase with credits. This experimental phase will give guidelines about future scope of JI, necessary safeguards and rules of the game. It should be regarded as initial effort to develop future markets by the IC and to examine possible gains by the DC.

Decisions concerning JI projects could be taken after careful considerations of socio-economic, scientific, political and environmental aspects.

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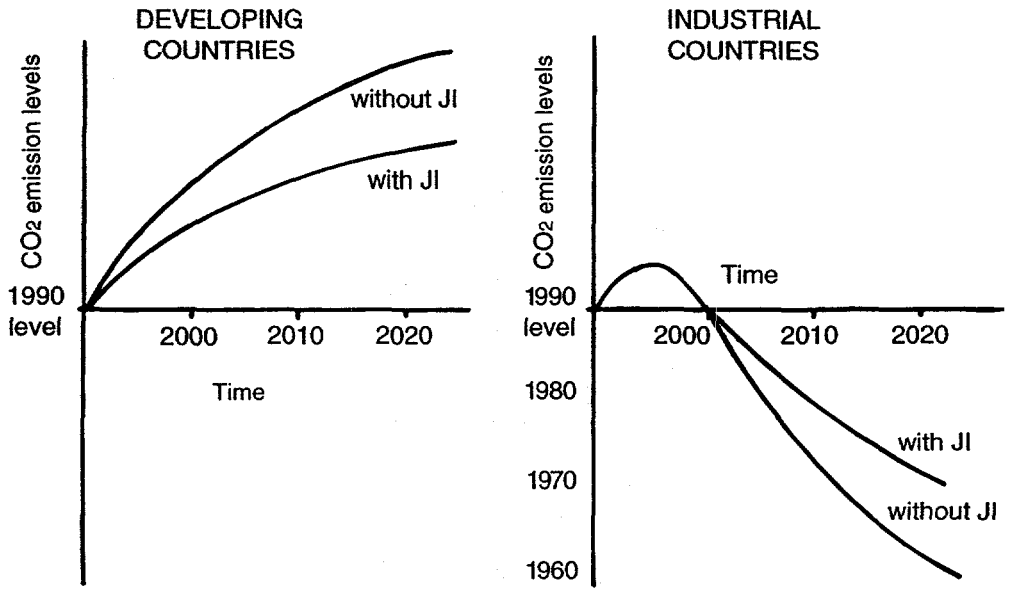
Appendix B

"Assistance but no carbon credit"
Reduced Pressure due to Joint Implementation



If the developing countries reduce their emissions due to JI, effectively, there is less build up of carbon emissions and less pressure to resort to severe cuts in emissions by the DC. Therefore, the chief advantage of JI for IC is less pressure in future to reduce emissions, if climatic uncertainties turns out to be more severe than we think now. This could be thought of as risk-aversion measures or insurance. That is, in future for example, instead of reverting to 1960 level, it may be sufficient to revert to 1970 level, if the global balance of CO_2 emissions is considered. Carbon credit is not explicitly given for every project, but the net result will be reduced pressure.

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Joint Implementation as a Financing Instrument for Global Reductions in Greenhouse Gas Emissions

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1. What is Joint Implementation?

The concept of "joint implementation" was introduced during the negotiations on the Framework Convention on Climate Change. This treaty (which was signed by more than 150 countries in 1992 during UNCED and will probably enter into force in early 1994) has established a regime of global action: general commitments for all countries to limit greenhouse gas emissions as much as possible, to cooperate in research, education and to report on national emissions and actions undertaken; more specific commitments by industrialized countries (OECD and Eastern-European countries, so called Annex I countries) to stop the growth of their greenhouse gas emissions (return the emissions to their 1990 levels by the year 2000) and to provide technical and financial assistance (OECD countries only, so called Annex II countries) to developing countries to promote technology transfer and actions to curb greenhouse gas emissions and to assist countries in adapting to climate change if necessary. These obligations were based on principles of precautionary action (uncertainty is no reason to do nothing), sustainable development (economic development in harmony with the environment), cost-effectiveness (the most effective action for the money spent) and common but differentiated responsibility (industrialized countries take the lead).

Article 4.2 of the Framework Convention states:"The developed country Parties ..... commit themselves specifically as provided in the following..... These Parties may implement such policies and measures jointly with other Parties and may assist other Parties in contributing to the achievement of the objective of the Convention." and ".. the Conference of the Parties, at its first session, shall also take decisions regarding criteria for joint implementation as indicated in ...".

Joint Implementation is clearly based on the idea of cost-effectiveness by providing parties with the opportunity to (partially) "off-set" their own emissions with (cheaper) reductions achieved elsewhere. Joint Implementation can therefore be defined as "realization of reduction of emissions by one Party (investor) on the territory of another (host)". It is obvious that such cooperative arrangements would have benefits for the host country as well. If used wisely, Joint Implementation could indeed contribute to the North-South cooperation that is embedded in the Climate Convention.

There is currently a debate on which countries would be eligible for Joint Implementation arrangements: only other Annex-1 countries or also developing countries (non- Annex I)? It is my interpretation that the convention, in particular art. 4.2, was not meant to exclude non-Annex I countries from Joint Implementation arrangements. There are also no legal grounds to assume such a restriction. The provision that criteria should be established by the CoP before Joint Implementation could be applied was deliberately included to ensure that application of this concept would be in the interest of achieving the objectives of the convention and the interests of all Parties. These criteria will determine whether Joint Implementation will or will not be a positive contribution to achieving that purpose. So we should focus on those criteria. They will determine which countries can play a role in such arrangements. We have to realize that certain criteria might more easily be met by non- Annex I countries than by Annex I countries.

Why go for a complicated idea of Joint Implementation when a more straightforward global system of tradeable emission permits would do the job of achieving cost-effective solutions much better? And would allow to bring equity considerations into play by allocation of emission rights in accordance with population size? It is this very point of allocating emission rights that is so complicated, that agreement over initial allocations is not likely to occur for the time being. It may take 10 or 20 years. Even for a rather homogeneous country as the United States it took years to agree on distribution of emission rights for SO2 as part of the new Clean Air Act. The North-

South distribution would be infinitely more complicated. Better therefore to make a pragmatic start with something like Joint Implementation. Joint Implementation could play a role in paving the way towards establishment of a tradeable emission permit system at a later stage.

In my introduction I will discuss the potential benefits of Joint Implementation, the risks and the question "how to manage Joint Implementation?" with some suggestions at the end how to proceed internationally.

2. Potential benefits of Joint Implementation

Potential to control global emissions and get quicker reductions towards objective of convention

In relation to the objective of the Convention - stabilization of greenhouse gas concentrations at a level that would prevent dangerous anthropogenic interference with the climate system - the real challenge is to control and reduce global emissions. When current scientific assessments are correct the necessary reductions might be in the order of 60% or more compared to present global levels. The Convention we negotiated makes a first small step in that direction by requiring industrialized countries to stop the growth of their emissions. Global emissions will continue to grow however due to the need of developing countries to alleviate poverty and provide their citizens with decent living conditions. Although industrialized countries now are responsible for 75% of global emissions, projections show that by 2025 or so developing countries will emit more than 50%. The gains that will be made due to the commitments of industrialized countries to stop the growth of their emissions will be far outweighed by the growth in emissions in developing countries.

Knowing that there are large differences in the costs of reducing greenhouse gas emissions between countries and that resources are limited, joint implementation offers a unique opportunity to reduce global emissions at much lower costs than through a policy of reductions in industrialized countries only. Several studies indicate that large benefits can be obtained through a least cost approach. A McKinsey study[2] indicated a 35% improvement in cost-effectiveness (35% more emission reductions for same costs) when going from a regional approach to a global one. Compared to a national approach the gains are much bigger. A study made for the Tennessee Valley Authority, one of the four largest electricity generating companies in the US, showed that a 20% CO_2 reduction in 2010 compared to 1990 levels could be done at 10-30% of the costs if a joint implementation/ cost effectiveness regime could be applied[3]. OECD studies show similar benefits[4].

It should however also be noted, that in industrialized countries it is often the political costs that are high, not so much the actual economic costs of actions. This is for instance the case when considering abolishing implicit subsidies in road transport or energy prices.[5]

Joint Implementation can generate new flows of capital from North to South

Implementation of the obligations of the developing countries in the Climate Convention will depend strongly on the available financial assistance from industrialized countries. In article 4(7) this is even specified. Thus successful limitation of the growth of greenhouse gas emissions in developing countries - absolutely necessary if global emissions are to be controlled and reduced - will require substantial flows of capital from North to South. The financial mechanism established under the Convention, with the GEF as its (provisional) operating entity, is

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[2] McKinsey Cy, Protecting the global environment: funding mechanisms, report prepared for the Ministerial Conference on Atmospheric Pollution and Climate Change, Noordwijk, November 1989.

[3] Environmental Defense Fund, Joint Implementation: sustainable development through trade in environmental commodities, New York, August 1993

[4] Burniaux,J.M., Martin,J.P., Nicoletti,G., Oliveira Martins,J., The costs of reducing CO2 emissions: evidence from GREEN, OECD, Economics Department Working Paper no.115, Paris, 1992.

[5] Information document on Joint Implementation, referred to in art.4, paragraph 2 (a) of the Framework Convention on Climate Change, Note by the French delegation to INC-8, Geneva, August 1993.

based on the principle that so called "incremental costs" of developing countries in taking preventive actions will be funded. Although there is still ample discussion about the exact meaning of the concept of incremental cost, it is usually seen as those additional costs of a project that will enable the project to take full account of limiting greenhouse gas emissions, when those extra expenditures cannot be justified by local or regional environmental concerns.

The GEF is likely to have something in the order of 1 billion dollars available for climate change projects over the next three year period. Although some growth of this amount is likely in the years thereafter, this amount of money is quite small compared to the needs that will be at least one order of magnitude bigger. If current development assistance funding would remain reserved for other needs - the Convention explicitly stresses that by talking about new and additional financial resources - other (additional) resources have to be found. The only realistic source I can think of is the private sector. If incentives can be created through Joint Implementation there is a real possibility that private sector capital flows from North to South can be increased to help finance the necessary investments in low-greenhouse gas technologies.

Joint Implementation can contribute to sustainable development in participating host countries

Joint Implementation should not be limited to planting trees of course, but more importantly should focus on investments in state of the art, efficient technologies. In that way Joint Implementation could generate substantial new flows of investment from industrialized towards participating countries that could reinforce economic development and technology transfer. By helping developing countries to avoid the fossil fuel dependency and the unsustainable pollution burden of the traditional development path of the present industrialized countries, those investments would move economic development in the right direction. Economic growth in harmony with the environment, that is the idea of sustainable development. Large scale investments in renewable energy sources and urban mass transit systems for instance, in stead of first building fossil fuel and automobile dependency and then making a costly shift after pollution has taken its toll.

3. Potential risks of Joint implementation

Joint Implementation is not an easy concept. It can be misused and then develop into a counterproductive idea. At the recent 8th session of the Intergovernmental Negotiating Committee for the Climate Convention, that is preparing the first Conference of the Parties, developing countries and environmental organizations expressed a multitude of potential risks of applying Joint Implementation, especially when this would include developing countries. I will give an overview of the most important arguments against Joint Implementation. Risks can be classified into three groups:

- equity issues (balance between industrialized and developing country actions)
- sovereignty issues
- "leakage" leading to slower global emission reductions

Equity

The industrialized countries have contributed by far the most to the increase in ghg concentrations in the atmosphere over the past hundred years and are responsible for about 75% of the current emissions. The Climate Convention therefore established a commitment of industrialized countries to take the lead in addressing greenhouse gas emissions. This is also in line with the polluter-pays principle that is embedded in the Convention.

The fear of developing countries is that Joint Implementation will allow industrialized countries to "buy themselves out of the problem" of reducing greenhouse gas emissions. Even worse, it would allow them to continue their production and consumption pattern and to continue to eat much more than their fair share of the greenhouse cake. Some people stress that the "day of reckoning" for industrialized countries' environmental behavior should not be delayed by allowing Joint Implementation.

These feelings risk to disturb the carefully crafted balance between actions of industrialized countries and developing countries, that allowed the Climate Convention to be signed by so many countries.

Sovereignty

A whole range of potential "sovereignty pitfalls" can be identified:

Joint Implementation could lead to a potential conflict over land-ownership, especially with tree planting projects. Although currently such projects generally do not aim at formal land-ownership by investors from industrialized countries, they do lead to long-term contracts over land use, with substantial "damage provisions" in case the forest would not be maintained. A somewhat similar point is a potential conflict with food production in developing countries if farmers would be massively attracted by the money they could get to grow trees as CO_2 offsets in stead of growing food.[6]

Another issue is the potentially negative impact of Joint Implementation on economic development in developing countries. Joint Implementation could take resources away from development priorities by steering the local investments and manpower resources (which are always required) towards donor driven preferences. There are also possibilities that Joint Implementation projects might lead to pressure from investor countries or companies to accept investor owned technology, that may not always be the most appropriate for the situation of the host country. The potential for undermining of the domestic manufacturing and technology base due to pressures by investors to use imported technology should also be taken into account. Crediting of greenhouse gas emission reductions could become a factor in decisions of foreign investors on the location of a new plant in situations not specifically designed for climate change purposes. Joint Implementation could promote competition among investors for the "best" countries or projects, leaving others "out in the cold".[7]

Then there is the so called "low hanging fruit" argument: developing countries fear that industrialized countries will come and use the cheap options to reduce GHG emissions; later on developing countries would then have to cope with the more expensive options themselves.[8] This of course presupposes future quantitative emission targets for all countries, which so far has not been the subject of serious discussion.

Leakage

If successful application of Joint Implementation would eventually result in slower global reductions of greenhouse gas emissions, the whole idea would of course be seriously flawed. This is not unthinkable, looking at the various "loop-holes" that have been suggested.

For instance, Joint Implementation might reduce or take away incentives for non-Annex I countries to be "promoted to" the status of Annex I country (with a quantitative emission target), in accordance with art. 4.2.g of the Climate Convention. It might be more easy to attract Joint Implementation capital without having Annex I status. Not that many countries, not even the newly industrialized ones, have shown an interest, but this provision of the Convention could of course be exploited in the future to expand the regime of quantitative emission reductions. The net result therefore would then be that these countries will continue to increase their emissions.

Then there is the issue of so called "double counting" (counting reductions under a Joint Implementation arrangement that does not exist or is much smaller than in reality. There are at least three varieties of this phenomenon:

- double counting/ type 1: investor countries claim credit for closing plants/facilities at home under their own national plan and take Joint Implementation credit for setting up a plant in another country that is better than what otherwise would have occurred in the host country, but that is similar to the plant closed at home;
- double counting/ type 2: host countries inflate their baseline: reductions are claimed against a situation which never would have occurred in the absence of the Joint Implementation project;

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[6] Parikh, J.K., Joint Implementation: a Southern Perspective, Indira Gandhi Institute of Development Research, Bombay, India, 1993

[7] Mintzer,I.M., Joint Implementation: one individual's view, draft paper, August 1993

[8] Parikh, J.K., see above, p.5

- double counting/ type 3: host countries inflate their baseline: claimed Joint Implementation reduction would have happened anyway.

Another potential source of leakage is related to long term technology development. Joint Implementation regimes would offer industrialized countries a large reservoir of cheap reduction options that can be reaped with available technology. This might then take away incentives for development of new, more sustainable technology in the industrialized countries. And that is the technology needed to provide sustainable solutions to the world to address the climate change problem in the long term. The net result would be a slower response to the climate change threat.

4. How to manage Joint Implementation?

How to reap the benefits of Joint Implementation while avoiding negative consequences? That is the challenge. A management challenge to be precise. What is required is a set of conditions and systems under which Joint Implementation would be allowed to operate. Joint Implementation is clearly not only a cost-effectiveness and environmental effectiveness issue. The valuable contributions made by OECD on identifying criteria under which Joint Implementation could be accepted under the Convention[9] lack a proper treatment of equity and sovereignty aspects, that determined developing countries' reactions to Joint Implementation during the last meeting of the Intergovernmental Negotiating Committee on Climate Change in August.

There are in my opinion 5 main categories of conditions that need to be fulfilled:

a. Emission reductions should be real

This category should answer the "leakage" question raised earlier. It is sometimes called the environmental effectiveness criterion. This includes aspects such as establishing clear baselines in order to avoid double counting. You have to be able to answer the questions "is this project leading to lower emissions than otherwise would have occurred?". Actions that are required by law would for instance not be eligible under Joint Implementation arrangements[10]. But how to come up with credible "business as usual" scenarios, if economic forecasting is as poor as it is? Can the baseline problem be solved without introduction of quantitative emission targets? Suggestions have been made[11] to use a "fence" approach by looking specifically at projects for which the baseline question can be answered easily, such as improving the efficiency of an existing district heating system. Whether this approach would be applicable at a larger scale remains to be seen. It is obvious that the baseline condition can be met much more easily by Annex I countries that have quantitative obligations under the Convention. However, even in this Annex I group there are potential complications in case one of the partners (such as an Eastern European country) faces serious economic recession leading to an autonomous decline of GHG emissions. We would not want this autonomous decline to be captured under a Joint Implementation arrangement, I think.

Some people suggest additional criteria to eliminate other forms of double counting. For instance, require investor parties to present an overall picture of activities at home and in host country, such as subtracting deforestation due to logging in the host country from a Joint Implementation afforestation project.[12] Or, use destination based accounting in stead of origin based accounting to eliminate crediting for exporting polluting industries to non-Annex I countries.[13]

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[9] Jones,T., "Operational criteria for Joint Implementation", Paper presented at the OECD conference on the economics of climate change, Paris, June 1993 and "Practical guidelines for Joint Implementation under the UN Framework Convention on Climate Change, OECD Group on economic and environment policy integration, Paris, May 1993.

[10] Environmental Defense Fund, see above

[11] The Alliance for Acid Rain Control and Energy Policy, Joint Implementation: meeting the global climate change challenge globally, Washington DC, July 1993

[12] Mott, R.N., Joint Implementation and carbon offsets, World Wildlife Fund, Washington DC, 1993

[13] EDF, see above

Other aspects under this category include for instance verifiability, available methods to quantify emissions and sinks (which may be particularly difficult for the time being given the complications of quantifying carbon absorption in forests), and clear accounting and reporting arrangements. It might be necessary to require more detailed reporting than needed under the Convention for non-Annex I countries that are participating in Joint Implementation projects.[14]

Finally, legal arrangements will be necessary to guarantee delivery of the projected reductions. An example is the contracts the FACE foundation signs with partners in various countries for afforestation projects with a 99-year contract period[15]. The risk of losing the reductions due to termination or loss of the Joint Implementation project requires insurance provisions. Especially in the case of forestry projects a sudden loss due to forest fires is a realistic possibility. Other projects may also fail to deliver the projected reductions. Although in principle actual reductions should be the basis for the credits obtained, some form of insurance will be required to protect against shortfalls.

b. Additionality

Joint Implementation arrangements should be strictly separate from and in addition to financial obligations of Annex 2 countries under the Convention. That is easy to arrange. Joint Implementation should also never erode the readiness of these countries to contribute to the financial mechanism of the Convention or to provide development assistance through other channels, which is much more difficult to prove. This latter aspect may require provisions that Annex I countries can only apply Joint Implementation after fulfilling a certain percentage of GDP in ODA, such as the internationally accepted 0.7% level.[16]

Also in terms of actions taken, Joint Implementation should be additional to what Annex I Parties are doing to meet their obligations under the present Convention. Joint Implementation reductions should therefore not count against the obligations to reduce emissions to the 1990 levels by the year 2000. This will ensure that these countries indeed stop the growth of their own emissions.

c. Balance between actions taken within industrialized countries and elsewhere

Even if Joint Implementation would be restricted to contributing to further emission reductions beyond the current commitments, there need to be mechanisms to ensure a proper balance between actions in industrialized countries and elsewhere. The reason: the equity considerations described above as well as the risk of slowing down technological innovation. I would like to briefly discuss three possible options for a practical system to handle these aspects.

One is the concept of **partial crediting.** Under a partial crediting system a certain percentage of the actual reductions achieved by a Joint Implementation project can be used for crediting against (future) commitments of Parties. First of all the credit from the Joint Implementation project might be shared between investor and host. Secondly, restrictions might be put on the total of Joint Implementation reductions (say 5% of own emissions) or on the share of Joint Implementation reductions of the total reductions of the investor party (say no more than 25%).[17]

Another option would be to make use of a **clearing house concept.** This would mean that Parties wanting to get credit for Joint Implementation projects would have to go through a central clearing house or "fund". Credit could be obtained against a set price (for example: $10/ton). The fund then will use those funds to get actual

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[14] EDF, see above

[15] Stibbe, W.A.S., Lubbers, F., A transfrontier approach to cost effective reduction of air pollution: an example concerning the applicability of the Joint Implementation concept, Dutch Electricity Generating Board, Arnhem, The Netherlands, August 1993.

[16] Paper distributed by Danish delegation to INC-8, Geneva, August 1993

[17] Note by the French delegation to INC-8, see above

reductions through a mix of cost-effective projects and will be able to do that at a lower cost (say $3/ton). The result would be a 3-fold increase in real reductions. I would like to call this the "global dividend". This could be a win-win proposition: global emissions would be reduced more rapidly, host countries would benefit in terms of increased technology transfer and investor countries would be cheaper off.[18]

A third- and maybe much simpler- approach would be to keep separate accounts for domestic and international reductions. Annex-1 countries might then assume international commitments (to reduce a certain amount elsewhere) in addition to domestic commitments. Such an approach is sometimes called a **"parallel accounting"** system. This could maybe evolve into a "dual commitment" approach when further steps to reduce emissions beyond the current commitments are being negotiated. The balance between domestic and international actions can then be managed by setting the relative obligations under these two categories.

d. Sovereignty

It is important that a Joint Implementation project fits within the priorities of the host country. The social acceptability of the Joint Implementation projects must be taken into account. To be certain that a project will be socially acceptable, local authorities and social organizations should be involved in an early stage, to discuss the potential impact of the project. It is also necessary to involve affected parties in the actual running of the project. Formal requirements of a social and environmental impact assessment may be introduced.

The supremacy of the national governments under Joint Implementation arrangements should be able to prevent many of the sovereignty problems. Credits are always given to a Party to the Convention, which clearly establishes Government responsibility. The private sector cannot act independently from investor and host country government if it wants its Joint Implementation projects to qualify for crediting.

To ensure that Joint Implementation projects contribute to sustainable development and are in line with local economic development priorities host government control is again the key. On the other hand it is of utmost importance that Joint Implementation project initiatives are focussed much more on things like improving energy efficiency, both on the supply as on the demand side, reductions in methane emissions from gas pipelines, flaring and waste treatment as well as on applying and improving renewable energy options.

A special issue is the so called life time of projects. To avoid the host party to be bound forever to a Joint Implementation contract, the life time of a Joint Implementation project should always be limited. It might be attractive to consider the Joint Implementation credits as being "leased" to the investor party for a given period of time.[19]

e. Good standing

The last category of criteria for Joint Implementation would cover general requirements of both parties in a Joint Implementation scheme to haven a "good standing", both in terms of complying fully with the Convention as well as on showing a good environmental record in general.

5. How to proceed?

How to get from the current situation of ideas on how to manage Joint Implementation to practical implementation? A number of important steps can be identified.

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[18] Merkus,H., The Framework Convention on Climate Change: some thoughts on Joint Implementation, CCD Paper no.11, Climate Change Division, Ministry of Housing, Physical Planning and Environment, The Netherlands, November 1992.

[19] Merkus,H., *see above*

Pilot projects

Practical hands-on experience with joint implementation is very scarce. This makes the debate about the role of joint implementation and the criteria that should be developed to ensure a proper application a somewhat theoretical exercise. It is important to make use of the available expertise of those who are experimenting with specific forms of Joint Implementation.

So far projects undertaken are almost exclusively forestry related.[20] Emphasis should be broadened to cover not only tree planting projects, because they are too sensitive politically, carry specific difficulties in measuring and monitoring, and are particularly vulnerable to the risk of losing the credit.

Create incentives

First of all pilot projects should be encouraged. This might require arrangements that future crediting of pilot project reductions if they eventually will satisfy the conditions specified by the Parties. Generally there is a reluctance to allow crediting of actions that were initiated before the agreement of the criteria. However this may limit the interest in starting a variety of pilots, especially if private sector involvement is an important element.

The next step in creating incentives would be to establish a parallel accounting system, at least on an interim basis. This would eliminate most of the difficulties related to the crediting question and it could be an incentive for countries to show their "good standing" by voluntarily entering into Joint Implementation projects in addition to commitments taken under the Convention. Building on such a parallel accounting system, the next step could be to add international obligations to the Convention, much in the same way as the current Convention requirements formalized voluntary commitments made by various industrialized countries before the Convention existed.

An alternative approach to create incentives for Joint Implementation in case an energy/carbon tax is introduced, would be to allow Joint Implementation reductions to be subtracted from the tax-base.[21]

Develop a managed multilateral model

The system of choosing a multilateral channel ("clearing house") to manage Joint Implementation was described above as a way to control the balance of actions in industrialized countries and elsewhere through a so called "intervention price" mechanism. It seems that this approach would also be able to provide solutions to many of the other potential problems identified. Mintzer[22] has elaborated this idea and points to the great advantages of an institution (or institutions, because more than one clearing house would not be excluded) to handle Joint Implementation crediting and the related accounting, verification and inspection aspects. Parikh[23] suggests to give such an institution a joint North-South governance. Would this not be an interesting challenge for the large internationally oriented environmental and conservation community to establish such a mechanism?

Make the oil producing countries part of Joint Implementation

As long as we do not deal with the problems substantial world-wide greenhouse gas reductions policies will create for countries that are heavily dependent on fossil fuel exports (in particular the OPEC countries), there is little chance we can move quickly enough to tackle the greenhouse problem. Can Joint Implementation be a way to involve OPEC countries in the Climate Convention machinery?

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[20] Stibbe and Lubbers, see above

[21] Parikh, J.K., see above

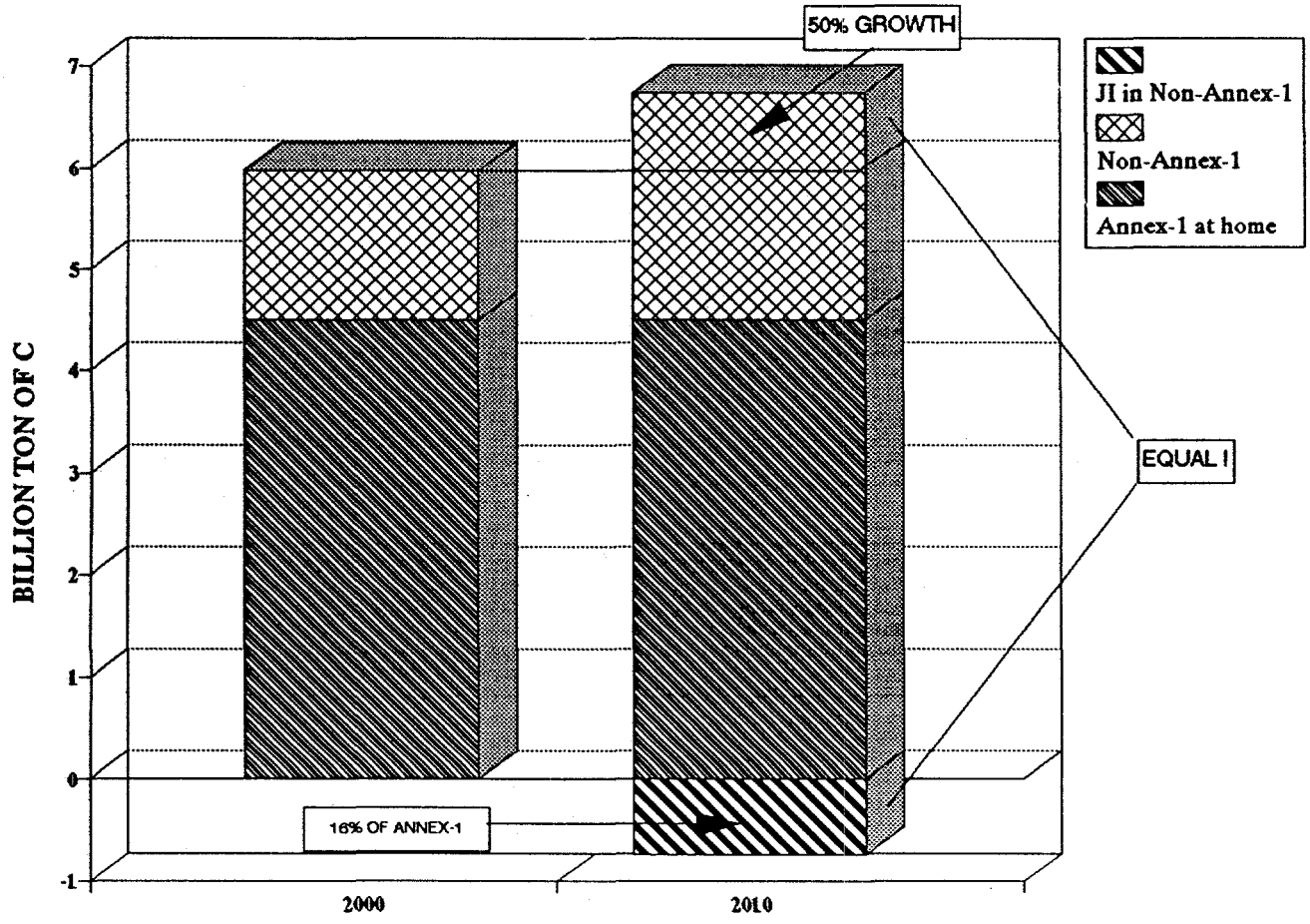
[22] Mintzer,I.M., see above

[23] Parikh,J.K., see above

It is imaginable to create a market for "CO_2 free oil". Oil producing countries could undertake for their clients to compensate the CO_2 emissions from burning the oil by projects in their own countries, such as eliminating gas venting or flaring at their oil and gas production sites, renewable energy projects, energy efficiency improvements or reforestation. There would be no need to stop at their own borders, projects in other developing countries would also be feasible. The way the client pays for these compensations would of course be through a "fee" added to the price of crude oil (a way of "internalizing" some of the external costs of oil?). This might open up an interesting market for oil producing countries, that can also be used to reduce their dependence on oil production.

These were some possibilities to bring the application of Joint Implementation closer to reality and increase the likelihood that it can play a constructive role in financing the required global greenhouse gas reduction.

STABILIZATION OF GLOBAL GHG EMISSIONS



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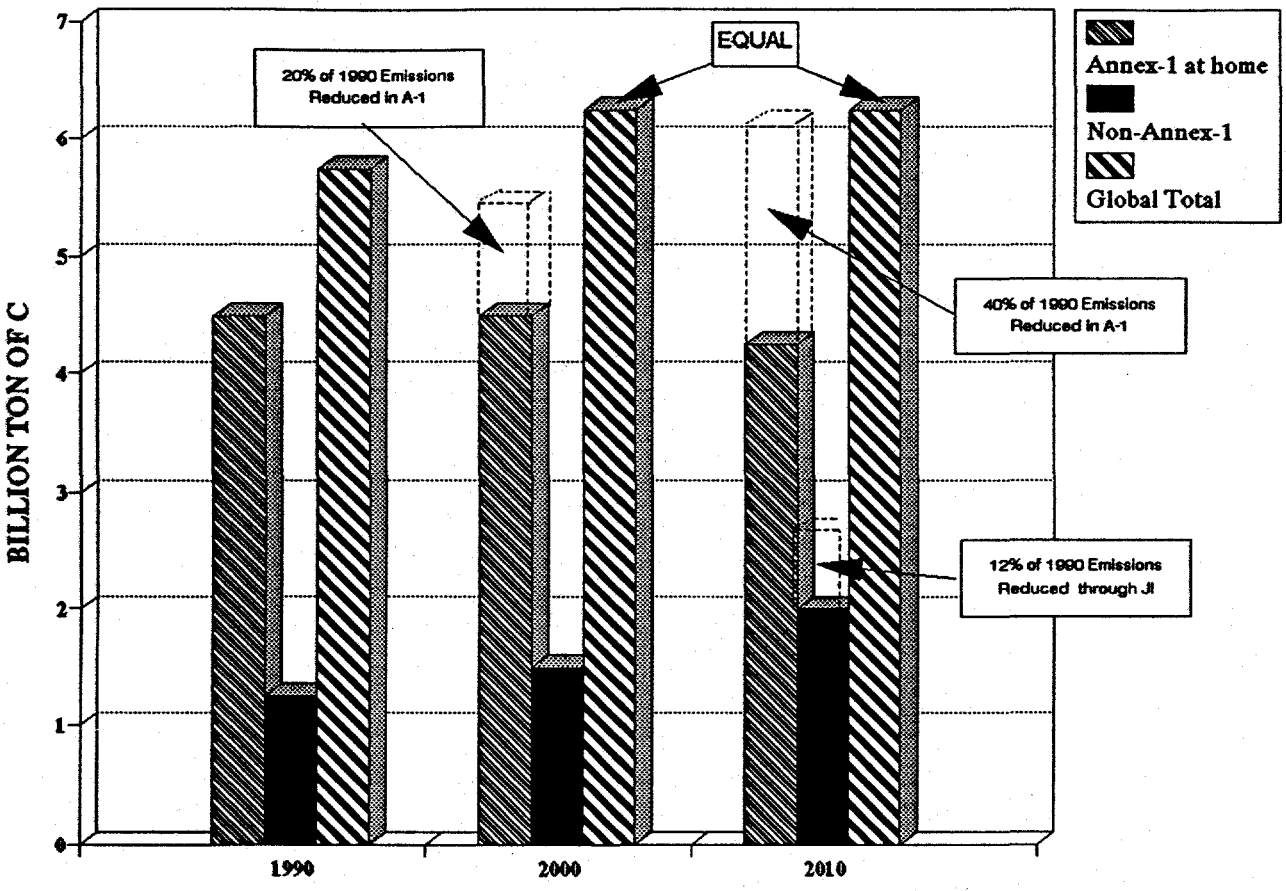

Forests as Carbon Sinks

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When the nations of the world signed and later ratified the United Nations Framework Convention on Climate Change (FCCC), they accepted the difficult challenge of stabilizing the composition of the atmosphere with respect to the greenhouse gases (GHGs). Success will require a reduction in both use of fossil fuels and rates of deforestation. Forests have a large enough influence on the atmosphere that one of the options for stabilizing the concentrations of GHGs in the atmosphere includes the use of forests as a carbon sink through reforestation of large areas. We identify in this paper the potential and the limitations of such projects. We discuss the implications of four approaches in management of forests globally: (i) continued deforestation, (ii) halting deforestation, (iii) net reforestation including agroforestry, and (iv) substituting the use of wood fuels for fossil fuels.

Forests and their soils globally contain a larger pool of carbon than the atmosphere contains at present. When forests are cleared, most of the carbon held in trees is released to the atmosphere, either rapidly with burning or more slowly through decay. About 25% of the carbon in the upper meter of soil is also lost to the atmosphere if the soil is cultivated. When cleared lands are reforested, carbon is withdrawn from the atmosphere and stored again on land. Logging, followed by regrowth of forest on the cleared land, may have almost no effect on atmospheric carbon in the long term, if recovery of the forest is complete. In fact, if some of the harvested wood is used in buildings, furniture, and other long-lasting products, logging and regrowth may lead to a net accumulation of carbon on land. Most logging is not very efficient, however, and relatively little of the original biomass ends up in storage. Furthermore, most logging today is not followed by complete recovery of the forest, and the net effect is a reduction in growing stocks and a net loss to the atmosphere.

1. CURRENT STOCKS OF CARBON IN FORESTS

Forests cover about 30% of the land surface and hold about 500 BMT C (billion metric tonnes of carbon) in live vegetation and about the same amount in their soils. The atmosphere, in comparison, holds about 750 BMT carbon. The global area of forests, by one estimate, is about 4300 million ha including fallows in shifting cultivation. If woodlands are also included, the total area is about 4900 million ha.

2. CURRENT NET EMISSIONS OF CARBON FROM DEFORESTATION AND REFORESTATION

The net flux of carbon to the atmosphere that results from changes in land use is not measured directly but calculated with models that keep track of the areas and ages of ecosystems in different land uses and the fate of carbon initially held in the ecosystem (that is, the burning and decay of wood and wood products as well as the oxidation of soil carbon). The calculations also include the re-accumulation of carbon in vegetation and soils of regrowing forests following logging, the abandonment of agriculture, or reforestation of other lands. The approach and the specific data and sources used in the calculations have been described in numerous published analyses.

2.1 Rates of change in the area of forests

With the launch of the Landsat satellite in 1972, direct measurement of the area and changes in area of different types of land cover became possible over the entire earth. However, the first systematic measurements of deforestation or other changes in land cover using satellites over large regions are just now getting underway in the FAO, the United States (through NASA, USGS, and EPA), and the Brazilian (INPE) and European (ESA) Space Agencies. Existing estimates of the rate of tropical deforestation incorporate results from a limited number of studies using Landsat data, but there has not yet been a systematic survey using such data over the earth as a whole or for the tropics globally. For the most part, estimates of the area of forests and changes in area in the tropics have been based, even now, on data from ground-based appraisals.

The first tabulations of data useful in this context were by the FAO and were for the late 1970's. These data were supplemented subsequently by other ground-based data and limited satellite surveys. Overall, the estimates at that time agreed fairly well for the entire tropics, although estimates for individual regions varied by up to 30%. The role of shifting cultivation in land-use change remained in question. A survey by FAO/UNEP reported the area of fallow to have increased between 1980 and 1985, and attributed 35, 70, and 50% of the deforestation in tropical America, Africa, and Asia to shifting cultivation. A study sponsored by the U.S. National Academy of Sciences (NAS), on the other hand, reported that shifting cultivation was largely being replaced by permanently cleared land, and that the area of fallow was not increasing, but decreasing. This discrepancy has not yet been resolved, although use of satellite data could resolve it. The estimate for the total rate of tropical deforestation in 1980 was 11.3 million ha.

In the decade since the late 1970's, estimates of the rate of deforestation in the tropics have increased. FAO's recent estimate is about 36% higher than their earlier one. There are qualifications, however. The FAO maintains that some of the apparent increase resulted from underestimation of the rate of deforestation in the earlier period. They acknowledge that the rate of deforestation has generally increased in the moist tropics, although it may have declined in some Asian countries.

According to Norman Myers, the annual loss of closed forests almost doubled from 7.34 million ha in 1979 to 13.86 in 1989, but Myers' recent estimate for Brazil, where the largest increase was reported, was too high. According to Brazil's National Institute for Space Research (INPE), the average rate of deforestation of closed forests in Brazil's Legal Amazonia between 1978 and 1989 was 2.1 million ha/yr. A slightly lower estimate was obtained recently by investigators at NASA. The actual rate probably increased between 1978 and the mid 1980's, but seems to have fallen substantially since then to 1.8 million ha in 1988/89, to 1.38 in 1989/90, and to 1.11 in 1991.

If these data for Brazil are more accurate than those used by Myers, the increase in the rate of tropical deforestation over the last ten years may have been about 40% rather than the 90% Myers suggested. The lower estimate may be reassuring, but an annual growth rate of nearly 4% in the rate of tropical deforestation is considerable. This revised estimate of deforestation for tropical forests is 15.4 million ha/yr.

Outside the tropics, recent changes in land use have been small, although major changes occurred in these regions in the past and may be underway again. In 1980, there were small increases in the area of forest in some countries and small decreases in others, but the changes throughout the temperate and boreal regions summed to zero. The most significant changes in these forests may not have been in area, however, but in stature, or the amount of carbon held in the trees and soils within forests. In areas adjacent to heavy industrial activity and in areas affected by air pollution, forest decline has reduced the amount of carbon held on land. In other areas the increased deposition of nitrogen and sulfur from industrial emissions may have enhanced tree growth and the storage of carbon, at least temporarily. Recent information also suggests that the frequency of fires over much of Canada and the U.S. may have increased. Whether the change is related to the global warming of the 1980's and whether it will continue in the future are, of course, unknown at present. The changes in large areas of temperate and boreal forests as a result of logging and regrowth, fire suppression, pollution, eutrophication, and increased fire frequency are not well known.

2.2 Changes in carbon stocks following changes in land use

Different types of land-use change cause different amounts of the carbon originally held in vegetation and soils to be lost to the atmosphere. Complete clearing of forests for crops causes all of the carbon in vegetation to be lost and about 25% of the soil carbon. When forests are cleared for croplands, some of the original biomass is burned, some is left as slash to decay on the surface or belowground, and some may be removed for wood products which are slow to be oxidized. Slash refers to the stumps, roots, and unburned woody debris left on the site following clearing and burning. The net loss of carbon from deforestation also depends on the type of land-use that replaces the forest. If plantations are established, for example, the net loss of carbon will be less than if the land were cleared for annual crops.

Logging followed by regrowth may cause very little loss of carbon over the long term. Logging is not considered deforestation here because logging, by itself, does not reduce the area of forests unless logged areas are subsequently colonized and farmed. Logging does reduce the amount of carbon held in forests if the logged forests are

not given time to recover before the next harvest. Reductions in forest biomass are much more difficult to measure than reductions in area, but they seem to be widespread throughout Africa and Asia. Recent studies in South and Southeast Asia show that changes both in area and biomass within forests appear to have reduced the storage of carbon in the vegetation of tropical Asia by about 50% since 1850.

2.3 The net flux of carbon from forests

The global net release of carbon to the atmosphere from deforestation and reforestation is estimated to be about 1.5 BMT C per year, almost entirely from tropical forests. Tropical Asia and America have the largest emissions. Outside the tropics the net flux is estimated to vary between about 0 BMT C/yr (releases balance accumulations) and an accumulation of as much as 0.7 BMT C/yr. The accumulation is largely the result of forest growth on lands previously harvested or cultivated. The uncertainty surrounding these estimates is high. It results from the uncertainties in rates of deforestation, in stocks of carbon, in areas reforested and in the effects of pollution and other chronic disturbances.

3. THE FUTURE: POTENTIAL EMISSIONS AND ACCUMULATIONS OF CARBON

If current rates of deforestation in the tropics were to continue for another 100 years, most tropical forests would be gone. Furthermore, approximately 100 to 300 BMT C would be released to the atmosphere in the process. At the low end of the range, this release is similar to the release of carbon from changes in land use over the last 150 years (Fig. 1). At the high end of the range it would be similar to the combined releases to date from worldwide changes in land use and from combustion of fossil fuels (Fig. 2). Few people believe that tropical forests will be eliminated from the face of the earth, but the current rate of deforestation reduces the area of remaining forests by about 0.8% each year, and the rate itself seems to have increased by about 40% over the last 10 years.

FIRST STRATEGY: Forests may be managed so as to decrease the rate of global warming rather than increase it. The potential role of forests in stabilizing concentrations of atmospheric CO_2 can be seen from a consideration of different management strategies (Table 1). The first "strategy" is the one practiced today. A total of about 8 BMT C are released to the atmosphere annually, 6 BMT C from fossil fuels and about 2 BMT C from deforestation. Reforestation of cleared land plays a minor role globally.

SECOND STRATEGY: If deforestation were stopped, total emissions of carbon, both fossil emissions and emissions from forests, would be reduced from 8 to 6 BMT C per year.

THIRD STRATEGY: In this strategy, massive reforestation, through either natural regeneration or planting, could be initiated over hundreds of thousands of hectares. Estimates suggest that on the order of 100 million ha might be reforested in Europe and the US. There may also be as many as 500 million ha of degraded lands in the tropics that might be reforested and another 365 million ha of fallow that could return to forests if shifting cultivation were successfully replaced with low input permanent agriculture. If all of these lands were reforested, on the order of 150 BMT C might be withdrawn from the atmosphere over the course of a century or so (an average of about 1.5 BMT C/yr). The area required (500 to 1000 million ha) is about half or all the area of the U.S. Furthermore, reforestation of abandoned lands may be difficult in many regions: abandonment often occurs because the lands no longer support productive agriculture. Reforestation may require inputs of energy, nutrients, and water.

From 100 to 200 million ha must be reforested to remove 1 BMT C from the atmosphere in 1 year. The area is considerably greater than the area of deforestation required to release 1 BMT C/yr. The explanation is that regrowth takes decades, while releases occur rapidly — sometimes in a single year. The area required to store carbon may be less in the tropics because growth rates are generally higher there. But, on the other hand, tropical forests will mature (and cease to be a sink) well before the slower growing forests of the north, because the total amount of carbon held in the two types of forests at maturity is similar.

The area available for accumulation of carbon in tropical agroforestry (that is in croplands and pastures) is approximately 1900 million ha. Although the accumulation per unit area is considerably less in agroforestry than in forests, perhaps as much as 1.5 BMT C could be accumulated in agroforestry if large areas of agricultural land were planted sparsely with trees. This strategy would reduce total emissions of carbon to about 6.5 BMT C (Table 1).

The advantage of agroforestry for sequestering carbon on land is that agroforestry is compatible with, and may even enhance the productivity of, existing agricultural land. In contrast, reforestation is competitive with agricultural use of land. Nevertheless, the withdrawal of carbon from the atmosphere into woody biomass, whether through reforestation or agroforestry, only continues while the trees or forests are growing. Once grown, the tree crops or trees will hold, perhaps, 150 BMT C, but will no longer withdraw carbon from the atmosphere. Reforestation will stabilize atmospheric concentrations of CO_2 only temporarily, at best. On the other hand, the greatest benefits from reforestation may not be storage of carbon but a lessening of pressures on undisturbed forests. If reforestation with agroforestry provided a source of local fuel and income, degradation and deforestation of nearby forests might be reduced. Thus, reforestation might help with the second strategy, stopping deforestation completely. The second and third strategies together would almost halve the annual global emissions of carbon to the atmosphere.

FOURTH STRATEGY: This is the most effective, although currently impractical, way to use "forests" to manage atmospheric carbon. In this strategy, wood fuels, grown sustainably, would be substituted for fossil fuels as the major source of fuel worldwide. Burning wood does not eliminate emissions, but under sustainable management the carbon emitted from burning wood is accumulated by the forests growing next years' fuel. Wood, itself, would not be used as the end fuel; it would be converted to ethanol, hydrogen, or some other fuel suitable for transport and efficient use. Under this strategy, the major contributor of CO_2, fossil fuels, would be eliminated. Total emissions would be only 2 BMT C annually if deforestation continued. If the substitution of wood for fossil energy were combined with a halt to deforestation, the total global emissions of carbon could be reduced, theoretically, to zero. Increased efficiency of energy use as well as use of other renewable energy sources would, of course, reduce the requirements for all fuels.

The intent of presenting these strategies is not to suggest that management of tropical forests should be used to solve what is largely an industrially caused problem. The intent is to show the magnitudes of carbon and land involved, and the magnitude of the changes involved in stabilizing concentrations of CO_2 in the atmosphere. Clearly, reductions in the industrial emissions of greenhouse gases will have to play a major role in any strategy.

Table 1. Potential annual emissions of carbon (BMT C/yr) to or from the atmosphere from human activities. Positive values indicate emissions; negative values indicate a removal of carbon from the atmosphere.

Strategy	Fossil Fuels	Deforestation	Reforestation*	Sustainable harvest of fuel	Total emissions	Potential reduction from present
1	6.0	2.0	<0.1	0	8.0	0%
2	6.0	2.0	-1.5	0	6.5	20%
3	6.0	0	<0.1	0	6.0	25%
4	0	2.0	0	0	0	75%

1 This strategy represents current (1990) emissions of carbon.

2 Reforestation: 150 BMT carbon might be stored in new plantations, in forests protected from further logging and shifting cultivation, and in agroforestry. The accumulation of carbon is assumed arbitrarily to take place over 100 years.

3 No deforestation.

4 Replacing fossil fuels with wood-based fuels grown sustainably (this assumes the world energy consumption will not increase substantially above 1990 rates). Combustion of wood fuels emits as much, or more, carbon to the atmosphere as combustion of fossil fuels. The emissions from wood, however, are balanced by accumulations of carbon in the forests growing to provide the next years' fuel.

* This annual accumulation of carbon in growing forests only persists while the forests are growing or while new lands are being reforested. Once forests have regrown, in 15 to 100 years, they continue to hold carbon, but they no longer withdraw it from the atmosphere.

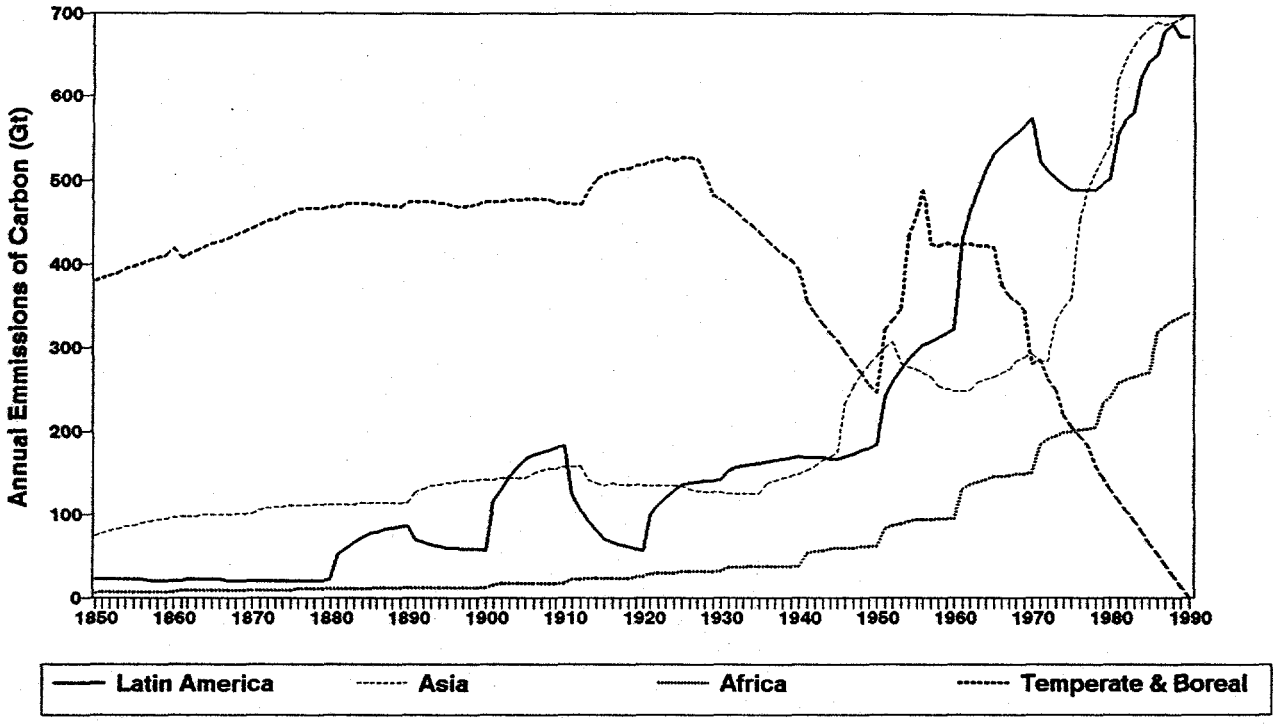

Figure 1. Net annual flux of carbon to the atmosphere from changes in land use in different regions.

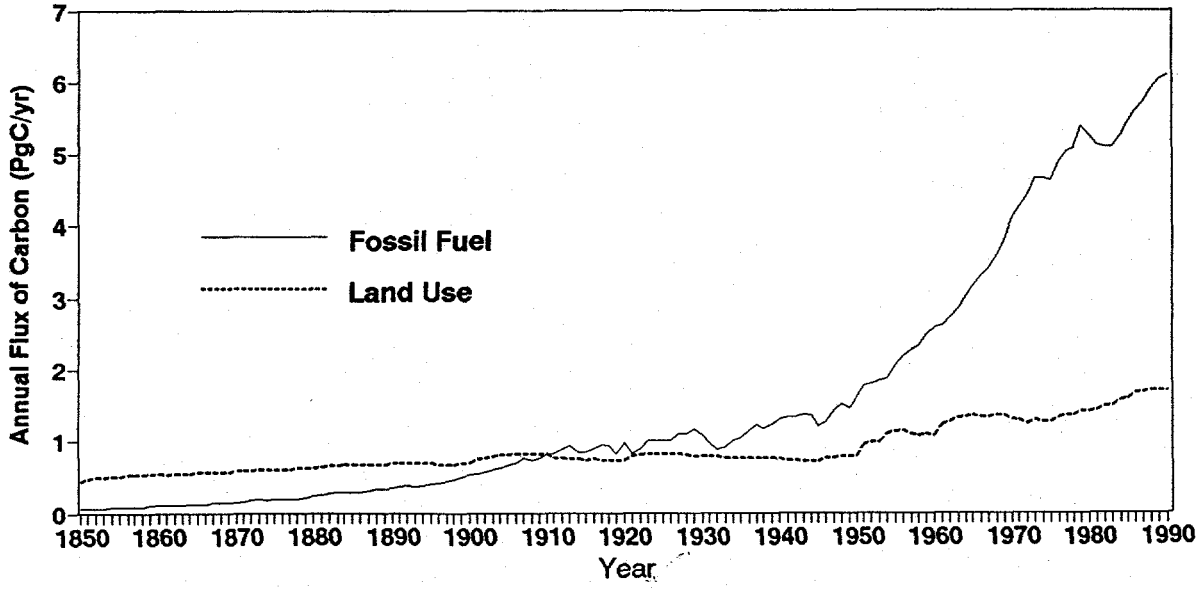

Figure 2. Annual global emissions of carbon from combustion of fossil fuels and from changes in land use.

Institutional Options and Operational Challenges in the Management of a Joint Implementation Regime

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INTRODUCTION

In 1992, the delegation from Norway introduced a concept into the negotiations of the Framework Convention on Climate Change which they called Joint Implementation. The term Joint Implementation (or simply JI) has been used subsequently to describe a range of cooperative arrangements between countries that are designed to reduce the risks of rapid climate change in a cost-effective manner. These arrangements may lead to the implementation of specific projects that seek to reduce emissions of greenhouse gases (also called GHGs) to the atmosphere or increase the absorptive capacity of terrestrial and oceanic sinks for these gases. As an outcome of these projects, the countries may divide any greenhouse "credits" that accrue and that are recognized by the international community pursuant to the terms of the Framework Convention.

The concept of joint implementation was accepted in the negotiations and formally adopted into the draft of the Climate Convention that was signed in Rio de Janeiro at the Earth Summit. Cooperative arrangements for emissions reduction are referred to in Article 3, Para 3 and explicitly provided for in Article 4, Para 2(a) of the Convention. Article 4, Para 2(a) notes that "Parties may take such policies and measures [on the mitigation of climate change] jointly with other Parties and may assist other Parties in contributing to the achievement of the objective of the Convention." Article 3, Para 3 urges governments to take "into account that policies and programs to deal with Climate Change should be cost-effective to ensure global benefits at the lowest possible cost," and notes that "efforts to address climate change may be carried out cooperatively by interested Parties."

But, because no operational definition of Joint Implementation could be agreed during the first phase of negotiations and because the whole concept was viewed with some skepticism by a number of developing countries, no specific guidance on the meaning and application of this concept was given in the text. Now, as the INC begins the implementation stage of the Convention, the importance of developing management structures and operational guidelines for any future regime of Joint Implementation has become increasingly evident. This paper explores some of the possible management structures that may be used in a Joint Implementation regime and raises a set of issues and challenges that will need to be addressed irrespective of the institutional and management structure that is chosen as a vehicle for carrying out JI projects.

The Objectives of Joint Implementation

Joint Implementation programs can be designed to serve many different purposes. There are three key objectives that can be achieved by facilitating Joint Implementation under the Climate Convention. The first objective of any Joint Implementation program is to identify and pursue cost-effective opportunities for reducing the rate of atmospheric buildup of GHGs. Since the costs and extent of opportunities for achieving emissions reductions or sink enhancements vary among countries and across regions, Joint Implementation allows one country (or regional economic integration organization or private enterprise) to underwrite the relevant activities in another country at costs per tonne that are lower than those which could be achieved domestically.

The second objective of Joint Implementation is to support and encourage sustainable development. This must be achieved while maintaining political momentum in both developing countries and in economies in transition for their continued participation in the international dialogue on the risks of rapid climate change. In many countries, absent the incentives provided by the Joint Implementation regime, the many other pressing problems that are perceived by national governments to be more urgent in the short term than is global warming might otherwise divert national efforts from measures and programs designed to reduce the risks of rapid climate change while promoting policies in support of sustainable development. By providing new and additional financial resources to support development-oriented projects in these countries, Joint Implementation can help

to steer these projects toward the path of sustainable development and encourage the continued involvement of these countries in international negotiations on the climate issue.

The third objective of any practical program of Joint Implementation is to encourage the application of private capital to the transfer of efficient, environmentally-friendly technologies. The most important technologies in this regard are those that can reduce GHG emissions or enhance GHG sinks while promoting and strengthening the development of emerging markets. The Joint Implementation process can help developing countries and economies in transition to acquire access to a large pool of private capital for technology transfer and the co-development of new technologies. This private capital pool is much larger than would be available if participation in the process were limited solely to governments.

In addition to these direct effects, Joint Implementation projects will also indirectly advance other policy objectives that are important at the local and regional level. For example, because emissions of local air pollutants often occur coincident with the emissions of greenhouse gases, Joint Implementation projects that reduce overall emissions through improvements in energy efficiency or the introduction of clean-burning, alternative fuel technologies will also reduce the emissions of the associated local air pollutants.

A Simplistic Concept of Joint Implementation

In discussions prior to the Earth Summit, the concept of Joint Implementation took on a number of alternate meanings. One simple definition of this concept is given below:

Joint Implementation refers to a process by which the government of an industrial country may provide designated quantities of targeted financial and technical support to the government of a developing country or to the government of an economy in transition. This bilateral support must be designated as a contribution to a project or program initiated by the receiving country in order to reduce GHG emissions (or increase GHG sinks), beyond what it otherwise would have done and beyond the level required of it under the terms of the Climate Convention. In exchange for its support of these emissions reductions (or sink enhancements), the industrial country receives partial credit for the net reductions achieved. The credit is applied toward meeting the obligations for net reductions that would otherwise be required of the industrial country under the terms of the Climate Convention.

A Broader Concept of Joint Implementation

To facilitate the development of a cooperative international regime which is both practical and efficient, I suggest expanding the definition given above for Joint Implementation in three ways. First, the sources of funds and technical support for Joint Implementation projects need not be limited to national governments. In this way, the regime can be expanded to cover contributions to joint ventures and other projects that are made by regional economic integration organizations and by private enterprises in the industrial countries. These projects would have to be initiated in cooperation with counterpart enterprises (either public or private) in developing countries and economies in transition. Nonetheless, the resulting "credits" would be divided between the accounts of the receiving or host country (where the project or program is implemented) and the investing 'country' (i.e., the country or regional economic integration organization within which the funding enterprise is located).

Second, the regime of Joint Implementation can also be expanded to cover contributions made by industrial countries and private enterprises to international or multilateral funding mechanisms. These mechanisms might include, for example, the financial mechanism of the Convention itself (i.e., the Global Environment Facility or GEF) or any new multilateral clearinghouse or "bank" that is developed specifically to facilitate the Joint Implementation process. Alternatively, the clearinghouse function could be provided by a private enterprise acting as a "mutual fund" or a trading house acting as a "market maker." In either case, the investing country or enterprise would not necessarily be associated with any specific project or venture in the receiving country, but the credits for the implemented activity could nonetheless be accrued against and divided between the obligations of the two countries.

And third, the terms of Joint Implementation can be interpreted to cover other bilateral arrangements. These could include investments made by one country included under Annex I of the Convention (i.e., industrialized countries and countries in transition to market economies) that would be located in another Annex I country or

in other countries that might meet certain criteria or conditions. They could also include examples of Joint Implementation that are based on the investments made by one developing country in another or by a developing country in an industrialized country or an economy in transition.

In summary, as used here, Joint Implementation refers to the process by which the government of one country or a private enterprise in such a country invests in measures, projects, or programs in another country in order to facilitate and support efforts to reduce greenhouse gas emissions or enhance GHG sinks in the receiving country. In recognition of this contribution, the government of the investing country (or the home country of the enterprise supplying the assets to the project) receives credit for a fraction of the emissions reductions achieved in the host country. This credit applies against the obligations for emissions reductions that would otherwise fall upon the investing country under the terms of the Climate Convention. The vehicle for managing the transfer of capital or technology and accounting for the credit may be either a multilateral entity or a bilateral agreement between the parties.

PERFORMANCE CRITERIA FOR JI REGIMES

Achieving an equitable regime of Joint Implementation will be a complex undertaking, regardless of what institutional form is selected as the mechanism of choice by the Conference of the Parties to the Climate Convention. Executing the regime will require balancing off the competing interests of those who invest in JI projects and those who act as hosts for these undertakings. It will also involve tradeoffs between the three principal objectives of the JI regime that are described above. Indeed, the success of any proposed JI regime must be judged simultaneously along many dimensions. The following section identifies eight candidate dimensions along which such projects might be judged.

(1) Promoting Ease of Entry into the JI Marketplace

For JI to be effective, many projects will be necessary and many players must be involved. The principal objective of the Climate Convention is to stabilize concentrations of GHGs in the atmosphere at levels that do not threaten to cause dangerous anthropogenic modifications of the climate system. The IPCC Scientific Working Group has concluded that stabilizing concentrations of greenhouse gases in the atmosphere will require reductions in the annual global emissions of long-lived gases by 60-80 percent. In order for JI to make a significant contribution to achieving the objectives of the Climate Convention, many projects must be developed, many technologies applied, and successful examples of technology development must be widely replicated. No one technology or type of project has the technical potential to contribute to reductions in net emissions of GHGs on this scale. Thus, JI can only make a significant contribution to this overall goal if the market for JI projects is open and accessible to many players. Any JI regime must be judged on the extent to which the proposed institutional structure promotes easy entry into the JI marketplace for new types of technologies and promotes innovative partnerships among enterprises in different countries.

(2) Minimizing Transaction Costs

JI projects will be attractive to the extent that they are less costly means of achieving net emissions reductions compared to the domestic opportunities available in the investing country. The JI regime will encourage investment in JI projects if the transaction costs associated with mounting new projects are kept low. The elements of these transaction costs include the search costs of hosts seeking investors and vice versa, the costs of accrediting the project and monitoring its performance, and any costs associated with insuring for liability against the prospects for premature failure of the project.

(3) Assuring Project Performance through Systematic Monitoring and Evaluation

An important component of any JI regime will be the provisions made for monitoring and evaluation of individual projects. Monitoring and evaluation will be necessary to ensure the continued confidence of the international community in the credibility of JI projects. This monitoring and evaluation activity could be the responsibility of the participants in the projects, it could be handled by local non-governmental organizations, or it could be part of the services provided by the international mechanism implementing the JI regime.

(4) Guaranteeing Fulfillment of Financial Commitments

JI projects will continue over many years. In some cases, the full costs of construction and operation of the JI project will be provided by the investor in advance. In other cases, the investor may provide only the capital and start-up costs at the beginning of the project and agree to make additional payments over the life of the project. Responsibility for assuring delivery on these financial commitments could be left to the participants in the project or guaranteed by the international mechanism operating the JI regime.

(5) Assuming Liability for Failed Projects

Many JI projects will involve little or no experimentation with new technology. The risks of engineering failures in these projects will, therefore, be no greater than would be expected with any other international development project. On the other hand, part of the attraction of JI is that it will promote the development of new technologies and the co-development or refining of existing ones. Some of the projects involving new technologies will inevitably fail to achieve their goals. One test of the JI regime will be how it deals with liability for such failures.

(6) Maximizing the Transfer of Environmentally Sound Technology

Whether the technology is new or mature, part of the allure of JI is its potential to promote the transfer and co-development of environmentally-sound technologies. These technologies, the backbone of a national or international strategy supporting sustainable development, are critical to reducing the risks of rapid climate change. The JI regime will be judged in part on its ability to promote such technologies in preference to recycling the same polluting conventional technologies that have contributed to the current state of global risk.

(7) Minimizing Net Emissions of Greenhouse Gases

Ultimately, achieving the principal objectives of the Climate Convention will require reducing emissions of long-lived gases by 60-80 percent. The success of the JI regime must be judged in terms of its contribution to achieving this goal.

(8) Supporting Sustainable Development

At the end of the day, the success of any JI regime and, indeed, of the Convention itself will be determined by its ability to support national development objectives in a manner which is sustainable on a global basis. Thus, the evaluation of the JI regime must address equally the question of whether it promotes sustainable development policies in the industrial countries at the same time that it does so in developing countries and economies in transition. The JI regime - and the Climate Convention - cannot be considered successful if it promotes continued growth in emissions in the North while only marginally slowing emissions growth in the South and East.

This section has laid out some of the dimensions upon which any proposed JI regime should be judged. The following section illustrates the range of possible institutional arrangements that may be fashioned to implement the JI regime.

ALTERNATIVE MANAGEMENT STRUCTURES FOR A JOINT IMPLEMENTATION REGIME

Joint Implementation regimes, as discussed above, may be developed as either bilateral or multilateral enterprises. Bilateral mechanisms may be useful if they establish lasting relationships between an investing country or company and a host country or partner enterprise. This continuing relationship may help to increase accountability and establish an incentive to promote the long-term success of the joint venture.

Some have claimed that the principal advantage of a bilateral approach to Joint Implementation is that the projects can be implemented easily, and can exploit either existing bilateral aid relationships between industrial and developing countries or the emerging network of aid relationships between industrial countries and economies in transition. At its best, this approach allows maximum flexibility, speed, and "learning by doing," but, most often, bilateral aid projects fail to deliver their expected benefits because they are built on erroneous, pre-conceived assumptions about conditions in the receiving countries.

The principal disadvantage of a Joint Implementation regime that is characterized by a set of bilateral agreements is that it will promote idiosyncratic and inconsistent arrangements. It may also promote a measure of competition among investors for links to countries with the "best" (i.e., either the cheapest or the most extensive) opportunities for emissions reductions. This situation could leave many countries "out in the cold" with few incentives to reduce emissions or to stay active in the international climate debate.

In this context, it is important to emphasize the international character of any successful regime of Joint Implementation. The rules required to operationalize the concept must, therefore, be developed in concert with all the other parties to the Convention. If any one country attempts to unilaterally impose a national view on this multi-state process, the cooperative dimension of Joint Implementation will be lost.

The advantage of a multilateral regime is that it can provide a consistent and systematic approach to exploiting attractive project opportunities in many countries. It can ensure that the same criteria for project selection are applied by all participants and that the interests of all the Parties are equitably reflected in "the rules of the game." For the purposes of this exposition, we will assume that all of the alternative management structures discussed below would operate within the context of a consistent, internationally-agreed, multilateral regime.

Multilateral regimes to manage the Joint Implementation process may take a variety of forms. Each brings its own characteristic strengths and inherent problems. The next section lays out a spectrum of such forms, reflecting different levels of intervention in the market by the international regime. The type of institutional form selected to manage and mediate the Joint Implementation regime will significantly affect the market architecture that evolves in this arena and the rate of implementation of JI projects.

Two Extremes on a Long Spectrum

One model for the management of the Joint Implementation regime is closest to the Free Market end of the institutional spectrum. I call this approach "**the Frontier Saloon**" model. In this scenario, the Parties to the Climate Convention adopt a *laissez faire* view of market evolution. All deals are bilateral arrangements among the Parties. There are no regulatory structures in place, no central institution monitors the completion or performance of individual projects. Prices are set by negotiation between investing and receiving countries on an ad hoc basis. Except for "word of mouth," no systematic vehicle exists to disperse information about potential projects or to disclose the availability of investment funds .

I call this **the Frontier Saloon** model because this vision of a wholly unregulated market gives rise for me to the setting of a saloon on the edge of a frontier. Two parties "belly up to the bar," make a deal to do a JI project, have a drink to seal the agreement, and plan to send a postcard to the INC Secretariat registering their claim for a future emissions credit. No one inspects the project; no one tests the claim; no one monitors project performance over time. The parties get their emissions credit solely on the good faith which the INC places in its signatories.

At the other extreme is a model I will call "**the One-Stop Shop.**" In this scenario, the Parties agree to vest all major powers of market development and regulation in a single central institution. This institution could be co-located within an existing agency or, alternatively, might be established *de novo* for this purpose. The **One-Stop Shop** would manage the evolution of the market in JI projects. It would distribute information about project proposals and available funds to governments and enterprises in both investing and receiving countries. It would set prices for JI credits. It would monitor the successful completion and continuing operation of JI projects. The **One-Stop Shop** would have responsibility for dealing with the results of promising projects which failed before the end of their expected life. In this scenario, the international institution would also be responsible for setting performance criteria for JI projects and encouraging the co-development of advanced technologies that can exceed the current standards for performance.

Middle-of-the Road Alternatives

A large number of possible alternatives can be imagined that fill the spectrum between the **Frontier Saloon** model and the **One-Stop Shop.** I will illustrate four of these alternatives in order to illuminate some of the important options available to the Conference of the Parties as it defines the guidelines for the JI regime.

The first of the less extreme models I call "**Hackers' Delight.**" **Hackers' Delight** refers to an institution designed solely for the purpose of exchanging information between those proposing to implement JI projects in receiving countries and those in investing countries seeking to buy carbon credits accruing from JI projects. The vehicle for this exchange could be as simple as a computer-based "Bulletin Board" that could be maintained, for example, by the INC Secretariat. The Bulletin Board would allow potential buyers and sellers of credits to meet in the privacy of their modem-connected offices, without having to "find" each other in person.

In the **Hackers' Delight** model, the JI management institution provides no services other than information exchange. This model is closest on the spectrum to the Frontier Saloon, but offers the added value of promoting ease of entry into the market by providing consistent information to all potential players. This model, however, provides no support for monitoring and evaluation, does not set prices, does not validate or verify claims by participants, and ignores issues of liability for failed projects.

The second middle-of-the-road model is one I call "**the Managed Market.**" In the **Managed Market**, the international JI institution acts as an honest broker, actively bringing together investors and proposers of JI projects. In this model, the JI institution is responsible for making good matches between the needs and skills of the investors on the one hand, and the capabilities and offerings of the receiving countries on the other. The institution may help to negotiate a "fair price" and may provide technical assistance to the Parties in the implementation of their projects, but the decision-making power rests entirely with the participants who have no obligation to follow the advice of the market managers.

The third alternative in this group is one I call "**the Mutual Fund.**" In this scenario, the JI institution not only collects information and brings individual buyers and sellers together, it also sets up syndicates of buyers and mixed portfolios of projects. The **Mutual Fund** actively encourages new participants to enter the market. It sets prices for participation in the portfolios and determines the amounts that will be invested in each project. Nonetheless, the implementing enterprises are still responsible for monitoring and evaluation of the project and for liability if it fails.

I call the fourth middle-of-the-road alternative "**The Central Clearinghouse.**" The **Central Clearinghouse** fulfills all the functions associated above with the Mutual Fund model. But, in addition, it provides verification of performance through regular monitoring of all projects by a cadre of internationally accredited inspectors. The **Central Clearinghouse** does not assume liability for projects which fail to meet their design goals.

Evolving the Market Architecture for Joint Implementation

Each of the six alternative institutional structures described in the previous two sections has particular advantages and disadvantages. One may be stronger along one of the eight dimensions outlined above, but none is clearly superior across all eight dimensions. Time has not yet allowed me to evaluate each of the six structures systematically across all eight dimensions, but I can offer some preliminary thoughts along these lines and indicate my own prejudice concerning the question of which structures might be most conducive to institutional learning during the early stages of a Joint Implementation regime.

Given the limited empirical knowledge now available on the subject of how to construct an international market for a commodity (such as carbon emissions) which has never before been traded in any market, it may be important not to "lock in" a permanent structure for the JI regime at this time. Rather, the international community should strive to develop a regime which can evolve and change over time. In that regard, I would suggest that a decision be agreed to develop a phased approach to the evolution of institutional structures for JI. For example, it may be useful to begin the process with a "Pilot Phase" in which many institutional structures are encouraged to develop at the national level and no international "credit" is distributed in consideration of successful JI projects. This phase could last for one to three years with an emphasis placed on monitoring, evaluation, and the exchange of information among participants in the JI regime.

The second phase of the JI regime might involve a period in which limited "credits" are accrued by JI projects and accounted for at the national level. During this period, which could last for five to ten years, these credits would not reduce the domestic reduction obligations of Annex I countries beyond some agreed and limited level. JI credits might be applied to national commitments under the Convention during this period, but the full

"value" of these credits would be limited to a level not to exceed, for example, five to ten percent of the national commitments for emissions reductions required by future amendments to the Convention.

The third phase of the JI regime could involve a period of formal market development in which countries and enterprises actively trade JI credits. This phase could only succeed if an international consensus were to emerge at the conclusion of the first two phases described above that the JI regime was equitable, effective, and an important support for the process of sustainable development.

Because it is not now possible to identify the "optimal" alternative structure for this new market, I will limit myself to a few comments on the characteristics of the alternative market structures described above. The first three alternatives, **the Frontier Saloon, the Hackers' Delight**, and **the Mutual Fund** may be the most attractive approaches in terms of encouraging ease of entry into the JI market and minimizing transaction costs.

By contrast, neither **the Frontier Saloon, the Hackers' Delight, the Managed Market** nor **the Mutual Fund** offers much to participants or others in terms of assuring project performance through systematic monitoring and evaluation of JI projects. On the other hand, the two remaining alternatives, **the Central Clearinghouse** and **the One-Stop Shop**, make active provisions for regular monitoring activities that will ensure the credibility of the JI regime. Only one alternative, **the One-Stop Shop**, assumes responsibility for failed projects and ensures host countries that the financial commitments which are made to them during project negotiations will be fulfilled, if they exercise due diligence in carrying out the project.

In terms of maximizing emissions reductions, encouraging early transfer and co-development of preferred technologies, and simultaneously supporting sustainable development, two alternatives stand out. **The Central Clearinghouse** and **the Mutual Fund**, offer the possibility of systematically promoting the development of the technologies that are capable of large emissions reductions.

In my opinion, none of these archetypes is an optimal choice. I think it will be important to choose an option that is somewhere in the middle of the spectrum. I believe that the most attractive elements of several of these alternatives might well be combined in an attractive way. The result would likely be an option that encourages the use of market mechanisms and does not set prices, but maintains a clear commitment to monitoring and evaluation of all JI projects. The exact form of this new institution can only be decided through open and vigorous negotiations among all the Parties to the Convention.

Project Selection and the Holy Grail of Cost-Effectiveness

In today's difficult times, all governments are under stress. Global recession has reduced the amount of funds available for public expenditures at the very time when the effects of economic, social, and environmental problems have begun to increase dramatically. Capital is especially scarce and hard to come by for investments in environmental protection and in the technologies needed for sustainable development.

It is not surprising therefore that many analysts have suggested that short-term cost-effectiveness should be the principle criterion for project selection under any cooperative regime of Joint Implementation. Great care must be taken with this simplistic approach.

While Article 3 of the Convention urges governments to take cost-effectiveness "into account," cost-effectiveness must not be the sole criterion for project selection. To the contrary, project selection must be guided by the principal objectives of the Convention, i.e., (1) stabilization of greenhouse gas concentrations at levels which do not threaten dangerous anthropogenic disruptions of global climate or food production, and (2) sustainable economic development and poverty eradication. In this context, it is necessary to recognize that projects underwritten by Joint Implementation must simultaneously help to meet the needs of sustainable development and fill growing demands for energy without imposing long-term irreversible damages on the global environment.

Focusing the Joint Implementation regime on narrow criteria of short-term cost-effectiveness could lead to the concentration of such investments exclusively in the one or two countries with the largest and least expensive opportunities for early emissions reductions. Pursuing this line of investment to the exclusion of all others will delay the development of technologies with the potential for the large emissions reductions that will be needed over the long term for stabilizing atmospheric concentrations of GHGs at safe levels. Furthermore, by concen-

trating Joint Implementation investments in a few countries, the momentum for broad participation in the international dialogue on the risks of rapid climate change will quickly be lost. The Joint Implementation regime must, therefore, set a delicate balance early on between the need to encourage and support the participation of the few states with the largest potential for emissions reductions and the many states with significant but not enormous potentials for such reductions.

In sum, countries that make a serious effort to achieve early reductions through cost-effective investments should be clearly recognized in the Joint Implementation regime. But the importance of cost-effectiveness criteria should be balanced against (1) the needs for regional balance and broad representation, (2) the need to support the transfer of advanced, environmentally less-damaging technologies, and (3) the need for capacity-building and institutional strengthening in developing countries to promote sustainable development.

Another potentially perverse result of a narrow focus on cost-effectiveness might be to reward countries with inefficient and out-moded energy policies. In a world where Joint Implementation rewards fell to countries with the most wasteful patterns of energy use (and thus the largest scope for efficiency-led reductions in emissions), the Joint Implementation regime could discourage or delay local investments in the rational use of scarce energy resources. Thus, by focussing narrowly on short-term issues of cost-effectiveness, the international process of collaboration on the problem of atmospheric stabilization could be seriously undermined or defeated entirely.

Monitoring, Accounting, and the Problem of the Baseline

A regime of Joint Implementation will only aid in achieving the overall objectives of the Climate Convention if it results in global emissions that are lower than they would have been absent the regime or if the size of global sinks is increased relative to what it otherwise would have been. To determine whether these conditions are being met requires two things: (1) a credible emissions baseline for each participating country and (2) a systematic, verifiable approach to monitoring of national and project-related emissions and sinks. In addition, in some cases, it may be necessary to include the monitoring of a proxy project or system representing what would have been implemented but for the existence of the Joint Implementation project.

Every signatory to the Climate Convention is required to prepare a current inventory of sources and sinks of greenhouse gases. Additionally, Annex I countries are required to develop a national action plan for reducing future emissions and enhancing domestic sinks in the next few years. This National Action Plan includes a baseline estimate of future emissions and sinks. In the future, all signatories will probably be required to develop national action plans of this type. Even now, developing countries are required by the Convention to communicate to the Secretariat a summary of the actions which they take to reduce emissions or to enhance greenhouse gas sinks. For all countries participating in the Joint Implementation regime, the baseline emissions projection developed in conjunction with the National Action Plan should represent the upper limit or "ceiling" for future emissions. Credits derived from Joint Implementation should be calculated against this ceiling. To be applicable as the basis for such credits, national baseline estimates should be reviewed by a competent and representative international body. This body could be the Scientific and Technical Advisory Panel of the GEF, or the Subsidiary Body on Scientific and Technical Advice of the Convention, or some additional technical advisory committee designated by the Conference of the Parties to the Convention.

To determine whether a proposed project or program will help to slow the atmospheric buildup of GHGs, it is necessary to compare the "with Joint Implementation" case to the "without Joint Implementation" case. Such a comparison is only possible when a baseline forecast of future sources and sinks is available. This is true for all countries, irrespective of whether future emissions and sinks are projected to grow, shrink, or remain the same. Thus, the establishment of a meaningful Joint Implementation regime requires the development of comparable baseline projections. These projections should be prepared using an internationally acceptable methodology that itself is part of the Joint Implementation regime.

It should not be necessary for a project earning credit under the Joint Implementation regime to demonstrate that it would not have occurred in the absence of the international regime. It should only be necessary to demonstrate that because the project or program was implemented, national emissions were measurably less than what was projected under the baseline assumptions. Unfortunately, this does not make the problem easier from the point of view of the international community. It merely shifts the burden of proof from the project or

program developers to those responsible for establishing the national baseline projections. The difficult task is to keep the resulting incentives for inflating the baseline from distorting the accuracy of the national projections of emissions and sinks.

Beyond the development and monitoring of a credible national baseline, implementation of a regime of international credits requires that each project be monitored and evaluated. This monitoring must be comprehensive and continuous over the lifetime of the project. To assure honesty and comparability of results, the monitoring and evaluation function should be carried out by third-party entities, independent from those contributing the investment capital and those implementing the projects. The monitoring and evaluation function should be executed in accordance with international protocols to be established by the IPCC or some similarly constituted body. This function could be executed by universities, non-governmental organizations, technical consultants, or multilateral institutions familiar with conditions in the host country.

To earn credits for the participants, each project must continue to demonstrate that it delivers the promised reductions in GHG emissions or enhancements of GHG sinks over its complete operating lifetime. If, at some time, it stops delivering the promised benefits, the flow of credits to investor- and host-country governments should end simultaneously. Beyond the loss of credits for emissions reduction, no further liability should be assigned as a result of project failures.

SUMMARY AND CONCLUSIONS

Carefully structured international regimes for the Joint Implementation of measures to reduce greenhouse gas emissions or to enhance greenhouse gas sinks can help national governments to achieve the major objectives of the Framework Convention on Climate Change. Continued broad participation in the international dialogue on policy responses to the risks of rapid climate change is necessary to achieve the objectives of atmospheric stabilization and sustainable economic development. Maintaining the current momentum for such broad participation will require that the international regime of Joint Implementation provide financial incentives for participation in the international process by a large number of developing countries and countries in economic transitions to a market environment.

Unilateral schemes to preempt the international process or to push forward Joint Implementation on a one-sided or simple bilateral basis will only undermine the collective effort to achieve the objectives of the Climate Convention. To avoid such outcomes, eligibility for participation in any international regime of Joint Implementation should be limited to those countries that have signed and ratified the Convention. In the case of industrialized countries, in order to show a good-faith commitment to their responsibilities under Article 4 of the Convention to demonstrate leadership in bringing future emissions down to the 1990 level, eligibility should be limited to those countries which have stabilized and maintained their domestic emissions at their 1990 level by the year 2000. In the case of developing countries and economies in transition, eligibility for participation in the Joint Implementation regime should be limited to those countries which have completed an inventory of their current emissions and sinks of greenhouse gases and which have also developed a baseline projection of future emissions and sinks.

Only those projects which can be regularly monitored and systematically evaluated should be eligible for international credits under the Joint Implementation regime. Cost-effectiveness should be only one of several criteria used in the selection of such projects for credit under the Joint Implementation regime.

One possible approach to organizing an international regime of Joint Implementation would be to establish a clearinghouse that could act as an intermediary or broker between investors and host countries. The clearinghouse, which could be housed within the financial mechanism of the Convention, would lease emission reduction credits for a fixed period at a specified price. It could then take the revenues from these sales and invest them in projects or programs in developing countries or economies in transition at a substantially lower price. The difference between the price of leased credits and the costs of projects would allow the clearinghouse to underwrite several tonnes of emissions reductions or sink enhancements with the proceeds from each tonne of leased credits. In addition, the clearinghouse could be required to achieve a measure of geographical diversity in project location and to invest part of the proceeds from each lease in activities designed to strengthen local institutions and to build local capacity in the host countries.

In this manner, the likelihood would be maximized that the Joint Implementation regime would result, on balance, in a net emissions reduction at the global level. It would also ensure that the Joint Implementation regime contributed to the secondary objectives of the Convention, i.e., promoting sustainable development and continued broad participation in the international process of developing policy responses to the risks of rapid climate change.

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17 January 1994

Matters Relating to Commitments Criteria for Joint Implementation

Note by the interim secretariat

CONTENTS

I. INTRODUCTION

A. Committee mandate

1. At its eighth session, the Committee had a first discussion on its task A.2, "criteria for joint implementation" (A/AC.237/24, para. 44). This discussion took place in the light of the note by the interim secretariat on this issue (A/AC.237/35). The Committee, with a view to preparing the decisions to be taken by the Conference of the Parties at its first session (COP 1), requested the interim secretariat to undertake the following tasks (A/AC.237/41, paras. 50-51):

(a) To provide further documentation on the issue of criteria for joint implementation, including a list of possible criteria, taking into account all the views expressed and submissions made during the eighth session, and any further comments which member States may have transmitted to the interim secretariat before 30 September 1993;

(b) To issue, upon request by the submitting country or organization and in the original language only, such documents that have been transmitted to the interim secretariat. (These submissions have been consolidated in documents A/AC.237/Misc.33 and Add.1 and made available to all delegations.)

B. Convention provisions

2. The Convention envisages that "efforts to address climate change may be carried out cooperatively by interested Parties" (Article 3.3). More explicitly, joint implementation is provided for in Article 4.2, which contains commitments specific to developed country Parties and other Parties included in Annex I (in this note, hereafter referred to as "Annex I Parties"):

- Article 4.2(a) reads in part: "Each of these Parties shall adopt national policies and take corresponding measures on the mitigation of climate change, by limiting its anthropogenic emissions of greenhouse gases and protecting and enhancing its greenhouse gas sinks and reservoirs. ... These Parties may implement such policies and measures jointly with other Parties and may assist other Parties in contributing to the achievement of the objective of the Convention and, in particular, that of this subparagraph" (emphasis added). In this context, the Convention notes that policies and measures adopted by regional economic integration organizations are equivalent to those taken nationally (see footnote to Article 4.2(a)).

- Further, Article 4.2(b) mentions "the aim of returning individually or jointly to their 1990 levels these anthropogenic emissions ..." (emphasis added).

- Article 4.2(d) provides that COP 1 "shall ... take decisions regarding criteria for joint implementation as indicated in [Article 4.2(a)]."

C. Scope of the note

3. This note is intended to facilitate the continuation of discussions regarding criteria for joint implementation activities. It revisits the concept of joint implementation in the light of discussions at the eighth session of the Committee, based on the note by the interim secretariat (see A/AC.237/35), and of submissions subsequently transmitted to the interim secretariat by States (see A/AC.237/Misc.33 and Add.1). The note sets out, as requested, a list of possible criteria for joint implementation for consideration by the Committee. These possible criteria seek to reflect the different stages of consensus emerging from the views expressed by States at the eighth session and in subsequent submissions. They attempt to capture those general themes on which a convergence of views could be perceived and also those on which a consensus might possibly be developing. The note does not, however, look at specific criteria and guidelines since they would be most usefully developed, on the basis of guidance by the Committee, pursuant to a discussion on general criteria. Finally, the note mentions the possibility of adopting a phased approach to developing the concept of joint implementation, which might include an experimental phase to build experience.

D. Possible action by the Committee

4. The Committee may consider the criteria put forward in this note with a view to making recommendations on them, recognizing that final decisions on criteria for joint implementation will rest with the COP. Inasmuch as any concerns are not met by the proposed criteria, the Committee is invited to consider how, building upon consensus reached thus far, further criteria could be developed to address such concerns.

5. On the basis of its deliberations and any conclusions reached, the Committee may wish to ask the interim secretariat to provide further documentation, such as a refined and extended list of possible criteria and guidelines for the practical aspects of joint implementation, for consideration at the tenth session.

II. POSSIBLE CRITERIA FOR JOINT IMPLEMENTATION

A. General considerations

6. A criterion is defined as "a principle or a standard a thing is judged by".* In developing possible criteria for joint implementation, the interim secretariat has endeavoured to capture key points of principle. The basis

* See Concise Oxford English Dictionary, Eighth Edition, 1990.

for this exercise, apart from the provisions of the Convention, is to be found in the interventions by, and submissions from, States. Submissions were received from 21 States, as well as from three non-governmental organizations. The interim secretariat has had to exercise its judgement in deriving possible criteria from these submissions. As noted in the conclusions of the Committee at its eighth session, joint implementation is a complex issue with far-reaching political implications. Nonetheless, the debate and the submissions indicate that a convergence of views seems to be emerging on many aspects. In view of the complexity of the issue, the Committee may wish to take a step-by-step approach when addressing the issue. Consensus on some key principles could be taken as the starting point and serve as the basis for addressing remaining concerns.

7. In order to move joint implementation beyond the conceptual stage, it is not only necessary to establish criteria, but also to develop guidelines for the more operational aspects. It will also be necessary, in due course, to consider the requisite institutional arrangements. Although the submissions provided many relevant suggestions on the operational and institutional aspects, these are not addressed in this note but are left for a later stage. Conclusions on criteria and guidelines for joint implementation might also be relevant to considerations on guidelines for first communications (A/AC.237/45), the roles of the subsidiary bodies established by the Convention (A/AC.237/46), methodological issues (A/AC.237/44) and the review of the adequacy of commitments in Article 4.2(a) and (b) (A/AC.237/47). Cross references could be taken up as appropriate.

8. Throughout this note it is assumed that any criteria for joint implementation would apply to actions under both Article 4.2(a) and Article 4.2(b). In cases where emissions limitations are mentioned, this should be taken to refer also to policies and measures to protect and enhance greenhouse gas sinks and reservoirs, with equivalent results, except where the context makes clear that the distinction should be made.

B. Criteria

9. In response to the request by the Committee, the interim secretariat presents the following list of possible criteria for consideration and further refinement.

10. **Possible criterion 1:**

Joint implementation refers only to joint action to implement policies and measures, and in no way modifies the commitments of each Party.

Comment

11. Joint implementation refers to policies and measures implemented jointly by an Annex I Party with another Party (or other Parties). Such policies and measures are here referred to as "activities". If a Party enters into any sort of joint implementation agreement, either as an "investor" or as the "host" to an activity, this would not modify its commitments. There would be no transfer of commitments from the Party acting as investor to the Party acting as host.

12. **Possible criterion 2:**

Joint implementation is distinct from the provision of assistance to other Parties.

Comment

13. Any joint implementation activity would be separate from, and in addition to, the provision of assistance to other Parties. This would mean, for example, that the commitments of Annex II Parties with regard to the financial mechanism or to the provision of technical assistance to other Parties, as provided for in Articles 4.3, 4.4 and 4.5, would remain untouched by joint implementation.

14. Joint implementation would widen the scope of financial options for Parties. While it could be envisaged that several options would be open to the host Party for certain activities, this Party might prefer joint implementation if this were to provide better (financial) conditions than other sources.

15. **Possible criterion 3:**

Joint implementation is a voluntary activity under the responsibility of two or more Parties; such activity must be undertaken or accepted by the Governments concerned.

Comment

16. In order for an activity to be classified as joint implementation under the Convention, it would have to be accepted as such, on a voluntary basis, by the Parties involved in the undertaking of an activity. Joint implementation activities could be undertaken by Governments or by the private sector. In the latter case, which may be the more frequent, the activity would have to be accepted by the respective Governments. International cooperation to reduce emissions that is not explicitly accepted by the Parties involved would not be considered joint implementation as such.

17. **Possible criterion 4:**

Joint implementation would be undertaken in conjunction with domestic action.

Comment

18. There seems to be agreement that, for various reasons, Annex I Parties should undertake a fair number of activities domestically, including technology development. Furthermore, it is generally understood that, for the present decade, joint implementation could play only a modest role in limiting emissions. This apparent convergence of views may, however, be based on differing perspectives. It may derive from the intention of some countries to achieve the aim with regard to the "benchmark" emission levels indicated in Article 4.2(b) through national actions alone, joint implementation activities being additional to such actions. However, countries that envisage the inclusion of "credits" from joint implementation in their calculated emissions levels nevertheless face practical constraints, such as the time needed for preparing and implementing joint implementation activities. This would preclude large "credits" in the current decade through such activities.

19. The Committee may wish to consider whether it wishes to recommend guidelines for Parties to the COP on any quantitative balance between domestic actions and those involving joint implementation. The Committee is reminded that any differences of interpretation on the nature or on the exact content of the national commitments might possibly be best addressed in its review of the adequacy of the commitments in Article 4.2(a) and (b) (see A/AC.237/47).

20. **Possible criterion 5:**

Joint implementation should be beneficial to all Parties involved, and be consistent with their national priorities for sustainable development.

Comment

21. Joint implementation may involve different degrees of partnerships. One example could be that of Parties with close economic ties that want to address jointly certain sectors, for example, the emissions associated with the electricity that is exchanged between these countries. Another possibility, which is perhaps more likely, is that of cooperation whereby one Party would provide the finances (the "investor") and the other would provide opportunity for cost-effective emissions reduction (the "host").

22. The concept of joint implementation has evolved out of considerations of cost-effectiveness, a principle accepted by the Convention (Article 3.3). It might be appropriate to take a broader view of this concept, consistent with the other principles of the Convention, in which activities should also lead to net benefits for the environment and for sustainable development.

23. The principal concerns expressed with regard to joint implementation are that it might divert an investing Party from taking national action and/or might run counter to the longer-term interests of the host Party. Some of these concerns are outlined in the following paragraphs.

24. Specific concerns with regard to the investing Party include the following:

(a) Joint implementation could be seen as a pretext for delaying national action and as possibly inconsistent with the "polluter pays principle";

(b) "Modifying longer-term trends in anthropogenic emissions consistent with the objective of the Convention" (Article 4.2(a)) necessitates research, development, demonstration and implementation of new technologies. Policies and activities to this end may be delayed if cheap alternatives are accessible through joint implementation. Similar concern regarding possible delays has been mentioned with respect to actions that are cost-effective and environmentally benign but for which the political will to implement them is currently insufficient;

(c) Cost estimates for possible actions in the investing countries may not reflect the real net costs, since they often do not include the full range of benefits for society. This would mean that such cost estimates would not be a suitable reference for actions in other countries.

25. Specific concerns expressed with respect to the host Party include the following:

(a) Joint implementation may not coincide with national priorities;

(b) Joint implementation may not be in the longer-term interests of host countries; those activities involving land use, such as (re)forestation, are frequently mentioned in this respect (for example, forests might need to be kept intact indefinitely for storing carbon, thereby blocking their use for agricultural or other uses);

(c) Joint implementation could be expected to focus first on the more cost-effective options, thereby increasing the average costs of future activities in the host country;

(d) The host Party might be in a weak position to negotiate a fair arrangement (for example, owing to lack of information on available technologies).

26. The criteria advanced in this note might be able to meet most of these concerns. Other concerns might be met by appropriate arrangements. For example, with respect to lack of information, Article 12.7 of the Convention could be noted. The host Party may also wish to make use of available sources of information to provide useful background; in this context, the Climex project that is being developed could be of use (A/AC.237/51).

27. **Possible criterion 6:**

Joint implementation activities should bring about real and measurable results, determined against reasonable baselines.

Comment

28. The information currently available on methodologies for projecting emissions (see A/AC.237/44) strongly suggests that any projections or scenarios of emissions at the national level would be imprecise and uncertain. Although such projections or scenarios would serve as useful background information for joint implementation activities, they would not provide a suitable basis for the calculation of emissions reductions associated with any specific activities. Each activity would have to be judged on its own merits, and for each activity an appropriate baseline would be needed. Such baselines would have to take into account all relevant factors, for example, including the effects over the full fuel life cycle of a project. They would also have to address such secondary effects as "carbon leakage", that is, an induced shift of activities to other places, counteracting the intended emissions reduction. Baselines would have to be reasonable, their assumptions being based on considerations of sustainable development, including effective environmental standards and sound economic policies.

29. The limitations on the use of a national baseline would be particularly relevant to Parties undergoing a recession, or with economies in transition. For many, if not all, of the latter Parties, the process of transition to a market economy seems to result in a period of decrease in the level of economic output, especially for heavy industry. In such cases, it can be expected that as a consequence national emissions will decrease significantly

over the present decade. However, the extent of such decreases is very difficult to predict. It may be self-evident that such a decrease of emissions at the national level could not be simply "shared" with another Party which might face an increase in its emissions. Any joint implementation activity between Parties would have to refer to well-defined, concrete activities that would lead to real, "robust" limitations that are in addition to any reductions expected from the general changes in the economy.

30. The requirement that joint implementation should bring about real and measurable results resulting from well-defined activities, would be equally applicable to all Parties, and would have to be verified by comparable methodologies. Double counting of emissions limitations has to be avoided and therefore appropriate procedures for communicating results need to be established.

31. **Possible criterion 7:**

The impacts of joint implementation activities would have to be assessed with respect to their economic and social, as well as environmental, effects.

Comment

32. Impact assessments would have to look at direct as well as indirect effects. The full cycle of processes involved in an activity would have to be considered with the aim of ensuring that it does not merely result in the displacement of emissions from one activity to another or from a Party where an activity will take place to another country (whether Party or non-Party).

33. **Possible criterion 8:**

Joint implementation activities should, where appropriate, be accompanied by measures to ensure their long-term environmental benefits.

Comment

34. Another concern is how to ensure that an activity will perform as projected. This involves not only the determination of actual results but also contingency planning. In all Parties there is the possibility that projects may fail sooner or later. However, it will possibly be the less mature and less stable economies that offer the best prospects for cost-effective action, but where the risk of failure may also be higher. Furthermore, the systems for the determination of environmental performance may not be fully developed under such conditions. Therefore, any accounting of benefits might have to reflect a certain safety margin. In addition, it may be necessary to consider some formal insurance against failure or to make other provisions to safeguard results. The most basic "insurance policy" would, however, be to select projects that are clearly of interest to the host country.

35. **Possible criterion 9:**

Joint implementation activities could address any greenhouse gas or any combination of gases.

Comment

36. Since Article 4.2(a) and (b) refers to "carbon dioxide and other greenhouse gases not controlled by the Montreal Protocol", joint implementation should be applicable to any of these gases. It would, however, be important to ensure transparency and accordance with agreed methodologies. "Transparency" would imply that results would have to be clearly identified with respect to individual gases and their sources. Calculations of results would have to be based on methodologies for all gases and, where appropriate, for applying the concept of global warming potentials. These methodologies are at different stages of development (see A/AC.237/44 and Add.1).

37. **Possible criterion 10:**

Parties should give priority to joint implementation activities resulting in emissions limitations.

Comment

38. Concern has been expressed about the compatibility with national priorities of actions on reservoirs and sinks. Joint implementation activities resulting in emissions limitations (which would include reductions) have not given rise to comparable concern and seem to be generally endorsed. Although the concern regarding reservoirs and sinks would be covered by proposed criteria 4 and 5 above, the conclusion might be that joint imple mentation activities regarding reservoirs and sinks should not be given priority. In addition, it would be necessary also for joint implementation activities regarding reservoirs and sinks to be accompanied by adequate methodologies to assess their results; however, these methodologies are not yet fully developed.

39. **Possible criterion 11:**

The benefits of joint implementation activities may be shared between the Parties involved.

Comment

40. There has been considerable discussion on how the efforts of partners in joint implementation activities would receive recognition under the Convention. There is less convergence of views on this issue than on several other possible criteria in the list. The purpose of including this possible criterion in the list is therefore not so much to signal emerging consensus, as to provide a possible starting point for discussion on this complex issue.

41. The issue of receiving recognition, which is also referred to as "crediting" or "attributing", would be most relevant in the context of quantified national emissions limitation targets. It can also be envisaged that Parties might want to obtain recognition in other ways, for example, by referring "credits" to benchmark levels (see possible criterion 4 above) or by comparing them to national emissions or national emissions reductions. There have also been suggestions to adopt a phased approach towards joint implementation, whereby initially the issue of receiving recognition would be left aside. In a later phase, possibly in the context of discussions on the evolution of the Convention, this issue could be taken up in a more focused way, taking into account the initial experience (see section III below).

42. If the Committee decides to discuss issues related to recognition, one issue would be how emissions limitations might be shared between investing and host Parties (for example, recommending a specific sharing of the emissions limitations, such as 50-50 or a range within which Parties could select appropriate shares, or leaving the choice to the Parties concerned).

43. If "credits" for emissions were to be shared, the investor would generate further reductions beyond its own share of the "credits". On the other hand, sharing would affect the cost-effectiveness for the investor, thereby reducing the potential for joint implementation activities.

44. **Possible criterion 12:**

Each of the Parties involved in a joint implementation activity would have to communicate relevant information thereon to the COP.

Comment

45. In order to verify the fulfilment of the criteria set by the COP, it would be necessary for Parties to report on their joint implementation activities. Guidelines on reporting can be developed after conclusions have been reached on criteria.

III. BUILDING EXPERIENCE

46. Many submissions point to the particular relevance of joint implementation for the period after 2000 and its role in implementing future, possibly more stringent, commitments under the Convention. Likewise, it might be expected that, in view of the complexities surrounding the issue and time needed to develop and implement activities, joint implementation could only be able to make a modest contribution to the limitation of global emissions in the first years after the entry into force of the Convention. Joint implementation might thus be

expected to show its full potential in the context of the future evolution of the provisions of the Convention.

47. This has led to suggestions for taking a phased approach to developing the concept of joint implementation under the Convention. Such phasing could take different forms. It could, for example, start with an experimental phase for the period until the COP has established definitive criteria. In this period, experimental activities could take place to build a broad foundation of experience, on the basis of initial guidance by the Committee and possibly later by the COP, and without prejudice to the criteria to be adopted by the COP. The provision of full information to the Committee and later to the COP on such experimental activities would be essential. Such information would refer, inter alia, to emissions limitations, but the issue of sharing recognition for such limitations might be left aside until criteria have been established.

48. The Committee may consider whether it sees merit in a phased approach, and if so, whether, for the period until the COP has established definitive criteria for joint implementation, it could endorse experimental activities between Annex I Parties and between Annex I Parties and other Parties.