

CONTRACTION AND CONVERGENCE

Draft Proposals for a Climate Change Protocol

Contents:...

Overview

Part I: Core tasks to achieve "Contraction and Convergence":

1. Recognise the prevention of dangerous climate change as an essential global security interest
2. Agree Danger Indicators
3. Decide CO₂ concentration target and timetable
4. Set annual global CO₂ emission budgets according to contraction formula.
5. Calculate relative national shares of the global budget according to a convergence formula
6. Allocate national CO₂ emissions quotas
7. Establish criteria and mechanisms for quota management

Part II: Proposals for contraction and convergence

A. Draft proposals for control of greenhouse gas emissions.

- 2.1. Set up a system for CO₂ emissions trading
- 2.2 Require International Airline and Shipping companies to purchase CO₂ emission quotas.
- 2.3. Consider national targets for anthropogenic emissions of other greenhouse gases
- 2.4. Agree potential Sanctions, Penalties, and Compensation

B. Draft proposals on climate damages

- 2.5. Monitor climate damages
- 2.6. Plan for emergencies
- 2.7. Consider options for damage compensation and historic debt

C. Draft proposals on Policies and Measures to aid implementation.

- 2.8. Establish financial mechanisms to aid implementation
- 2.9 Establish mechanism for development and transfer of sustainable technologies
- 2.10 Phase out fossil fuel subsidies
- 2.11 Require consistency in international policy making
- 2.12 Establish a forum for local governments

D. Proposals on research and education

- 2.13. Enhance education, training and awareness
- 2.14 Strengthen climate research particularly into feedback processes
- 2.15 Examine responsibilities of trans-national corporations and finance

Documents available separately on request

Appendix A: contraction formula

Appendix B: convergence formula

Appendix C: cumulative credit/debit formula

Definition of terms

Overview

The Prevention of dangerous climate change is now an essential global security interest. Recognising this interest, this GCI draft document sets out some key tasks necessary for a protocol to stabilise greenhouse gas concentrations at a level that would prevent dangerous anthropogenic interference with the climate system.

Pre-eminently, this requires a rapid “*Contraction*” of all human CO₂ emissions globally. Moreover, unprecedented international co-operation will be required to achieve this. Such a “*comprehensive approach*” is only likely to be adopted by most if not all nations, if it is linked to the simultaneous task of “*Convergence*” towards an equitable and sustainable level of emissions on a per capita basis globally.

This inter-linked configuration of “*Contraction and Convergence*” is fundamental to GCI’s view of the entire climate change dilemma and its solution. GCI has crafted such an approach, which provides the basis for this document. Part One of the document presents the core tasks of this approach. The first proposal develops the well-established concept of national security interest to include dangerous climate change as a *global* security interest. This emphasizes the urgency of this issue and has practical implications for the decision making process and technology development and transfer. The next six proposals spell out practical steps from agreement of danger indicators through to a mechanism for the management of national quota allocations according to a scientific assessment, a contraction formula and a convergence formula.

Additionally, the document presents further proposals for a protocol. These have been drafted in response to events at the Second Conference of Parties (COP2) to the Framework Convention on Climate Change in Geneva in July 1996. While we received remarkably wide-ranging support for our proposals for “*Contraction and Convergence*”, many questions were raised about the detailed implications of such an approach.

These further proposals are an attempt to map out some of these implications and are set out in Part Two. The first set concern emissions trading, air/shipping bunker fuels, other greenhouse gases and measures to deter non-compliance. The next set outlines the assessment of and compensation for climate damages, past, present and future. The next four points outline measures to aid implementation, including funding and technology transfer. The final three are concerned with education and research.

At COP2, the US Government stated that all protocols currently on the table were “*unrealistic and unachievable*”. This effectively sank the AOSIS Protocol proposed by the island-states most vulnerable to climate change. However, many states considered that our “*Global Commons Initiative*” for contraction and convergence was the most plausible basis for a comprehensive long-term protocol.

We, therefore, invite all far-sighted governments to consider incorporating all or part of these proposals into their submissions to the Secretariat by 15th October 1996 for discussion at the next AGBM meeting in Geneva this December, and as the basis for a draft protocol by March 1997 in time for consideration at COP3 in Kyoto. Please always bear in mind that this is a draft document and that we would greatly welcome your opinion and expertise in developing these proposals into a viable protocol.

I. Core tasks for achieving "Contraction and Convergence"

1: Recognise the prevention of dangerous climate change as an essential global security interest.

The reduction of greenhouse gas emissions shall be regarded as an essential global security interest for humanity.

RATIONALE AND POLICY IMPLICATIONS

This proposal generalises the accepted concept of "essential security interest" to the whole of humanity. The gravity of global climate change is greater than the essential security interests of any nation and fundamental to the maintenance of international peace and security during the coming century. This justifies the urgent development of measures proposed in this protocol and places a duty on governments to regard climate change as an international emergency. This also means that action may be taken to secure the use of sustainable technology for the benefit of humanity in much the same way as governments may protect the use of military technology under the Security Exceptions for intellectual property rights as set out in Article 73 of Annex 1C of the Final Act of the Uruguay Round of Multilateral Trade Negotiations as well as national security legislation.

2. Agree danger indicators

Agree a list of specific, quantifiable indicators to define "dangerous anthropogenic interference to the climate system" as stated in Article 2 of the Framework Convention. The indicators shall be listed in the protocol and their quantitative values shall be reviewed annually by SBSTA with advice from IPCC. The values should reflect the precautionary principle and take account of the time lag between emissions and climatic changes. The indicators shall be applicable on any geographical scale to include local damages induced by global climate change.

CoP shall commission detailed recommendations for suitable indicators and their appropriate values. The following suggestions are put forward as a starting point:

- a) relative sea level rise to a threatening level at any location;*
- b) increased coastal erosion that forces evacuation of inhabited land or loss of wetlands;*
- c) global mean surface temperature rise or significant regional temperature changes over a given time period;*
- d) an annual increase in the number of tornadoes or tropical cyclones in any region beyond current natural variability;*
- e) a significant reduction in permafrost area, resulting in release of natural methane;*
- f) significant changes in regional or sub-regional precipitation resulting in prolonged droughts or frequent flooding;*
- g) an increase in bush and forest fires above natural variability;*
- h) loss of marine and terrestrial ecosystems and species;*
- i) substantial prolonged reduction in marine primary production (plankton, algae);*
- j) a significant contraction of either polar ice cap and / or glaciers;*
- k) a major prolonged change in ocean circulation, such as the north Atlantic current or El Nino / Southern Oscillation;*
- l) a spread attributable to climate change of any human, animal or plant disease;*
- m) direct impact of climate change on human health;*
- n) economic damages attributable to climate change.*

These danger indicators should be reviewed on a regular basis by IPCC as new scientific evidence becomes available and revised by the CoP when prudent to do so.

RATIONALE AND POLICY IMPLICATIONS

This Task puts key scientific indicators for dangerous climate change at the centre of the protocol. The "definition of adverse climate change" (FCCC Article. 1, 1) and "dangerous anthropogenic interference with the climate system" (Article. 2) need to be set out in the form of specific danger indicators based on best scientific advice and the precautionary principle (Article 3).

Each indicator should reflect a distinct impact resulting from climate change and should be defined in quantifiable terms on a global, regional and subregional scale. Where possible they should indicate both the danger threshold and potentially dangerous rates of change. The choice of indicators should take into account the considerable time lag between greenhouse gas emissions and subsequent climatic response.

The prospect of breaching any one of the indicators should be sufficient to require preventative action, on the grounds of the precautionary principle, even though it may only affect one area of the world directly. On the basis of equity, damages must be avoided on a local scale since many of the most vulnerable countries are neither responsible for global warming nor in a position to adapt to the harmful effects. Local climate-change-induced damages may not be traded off against the pursuit of global economic growth, because it is impossible to sensibly create a consensus around the quantification of such damages in terms of rising risks of ecological and political instability (see also II.A.1).

3. Decide CO2 concentration target and timetable

A stabilisation target and timetable shall be agreed for atmospheric CO2 concentrations. The target should be set by applying the precautionary principle to avoid the danger indicators agreed under Section I.1 (above). This target shall initially be 350 ppmv to be achieved by the year 2100 . The target shall be reviewed every five years by IPCC as new scientific evidence becomes available and revised by the CoP if the danger indicators clearly show that it is prudent to do so.

Rationale and policy implications

Dangerous changes in the climate system are a result of specific greenhouse gas concentrations in the atmosphere, so it is necessary to set a specific ceiling on the amount of CO2 in the atmosphere. In absence of better scientific understanding of climatic feedback processes (listed in section II.D.2), the initial target of atmospheric CO2 stabilisation at 350ppmv by the year 2100 is chosen such that the system remains close to the bounds of our present knowledge. This can be achieved by following a future emissions scenario in which the cumulative CO2 emissions are similar to those of IPCC S350. When reviewing this target, IPCC should take into account predicted changes in the concentration of other greenhouse gases (considered further in section II.A.3).

4. Set annual global CO2 emissions budgets according to a "contraction" formula

The Conference of the Parties shall set a net global anthropogenic carbon emissions budget for each year throughout the period of contraction to meet the stabilisation objective as defined in I.3 above. This shall be calculated according to a mathematical formula which defines an emissions scenario that leads to stabilisation of emissions at around 2045. The formula may be reviewed annually five years in advance to take account of revisions to the stabilisation target set under proposal 3 as well as changes in natural sinks and sources based on scientific advice of the IPCC.

Rationale and policy implications

Stabilisation of CO₂ concentrations requires a global ceiling on emissions which contracts over time until they reach the target of 350 ppmv. The "contraction" formula would define a realistic emissions scenario which avoids both unachievable annual emissions reductions and temporary net negative emissions in the future. The formula should refer to all anthropogenic sources and sinks of CO₂, i.e. changes in emissions resulting directly from human activity, including anthropogenic changes of natural sinks and sources. Natural "equilibrium" sources and sinks should be considered in the science behind the emissions scenario, but should not be included in this global anthropogenic emissions budget.

The formula will need to be reviewed annually to take account of changes both to the concentration target and of actual sinks and sources of CO₂. However, in order to reduce uncertainty for both planning and trading purposes each annual review will adjust the budgets five years in advance.

Implementation will require setting up a Scientific Panel drawn from the SBSTA and approved by the CoP to agree the formula and recommend annual CO₂ budgets.

The target date of 2045 is suggested because it lies within the window for realistic contraction and coincides with the centenary of the United Nations.

For the purpose of illustration only, a sample "contraction" formula is available from GCI.

5. Calculate relative national shares of the global budget according to a "convergence" formula.

Each country shall be allocated an annual, relative share of the global emissions budget (set according to section I.4 above) using a consistent formula to calculate the proportion for each country for each year. The allocation shall be set such that national shares move gradually from present emissions levels to equal per capita emissions levels by a fixed "convergence" year (e.g. 2045). Provision shall be made for bunker fuels for shipping and air transport (see II.A.2).

RATIONALE AND POLICY IMPLICATIONS

This task gives effect to the principle of equity set out in Article 3.1 of the FCCC while recognising that equal per capita allocations would be neither acceptable nor feasible for Annex I countries if implemented immediately. The formula therefore provides a predictable and viable method of achieving a convergence to equity. National shares would be based initially on current emissions levels, or for Annex 1 countries, those levels already specified by commitments under the UNFCCC, and would then converge to the same per capita level by the target date of 2045. After this relative shares would remain constant.

Calculation with the convergence formula will use the UN median population estimates. These population statistics may be reviewed if necessary at the request of a majority of the CoP. However, after a fixed year (e.g. the convergence date) population figures could be frozen.

The relative national shares are independent of the annual scientific reviews, although the actual allocations of emissions (allocated in section I.6) will of course vary according to the global budget agreed. Annual shares would be calculated for all countries, whether or not they are Parties to the Protocol, and shall be set out in an Annex to the protocol as tables.

For the purpose of illustration only, a sample "convergence" formula is available from GCI.

The establishment of fixed national emissions budgets will encourage investment in appropriate technology and allow for the possibility of orderly emissions trading, but this depends crucially on having finite net CO₂ budgets calculated according to a formula that produces a predictable level of permissible emissions from the present to the stabilisation date, to achieve the concentration target set in Section I.3 above.

6. Allocate national CO₂ emissions quotas.

National emissions quotas shall be calculated for each year by multiplying each country's relative share set by the convergence formula (agreed according to Section I.5) by the annual global emissions budget (set by the "contraction" formula agreed according to Section I.4). These quotas shall be measured in tonnes of carbon.

RATIONALE AND POLICY IMPLICATIONS

The national allocations are described as 'quotas' rather than entitlements or rights to emit CO₂ in order to emphasise that the atmosphere and climate system are a global commons which cannot be appropriated by any state or person but whose use must now be shared by common consent. The formula approach provides for the most effective way of establishing a consistent and equitable allocation of emissions quotas.

7. Establish criteria and mechanisms for quota management

Establish a mechanism for the international management of quota allocation, accounting and verification based on criteria consistent with these proposals. The quotas shall cover "net anthropogenic emissions" resulting from human activities, including reduction of natural sinks minus deliberate natural sinks enhancement.

RATIONALE AND POLICY IMPLICATIONS

The allocations would refer to "net anthropogenic emissions" of CO₂. This is defined as all emissions resulting from human activities, including reduction of natural sinks minus deliberate natural sinks enhancement. However, this should exclude changes in natural sources and sinks caused directly by global climate change. This definition encourages sustainable forestry, for example, but avoids crediting the existing natural resource endowment of each country. We recognise that some countries have deliberately retained such resources whilst others have already diminished them, therefore this will be accounted for in the task concerning historic debt (section II.B.3). Natural sink enhancement will only be credited within national boundaries, not within any global commons. For example, credit will not be given for enhancement of the CO₂ sink into the ocean.

The proposed mechanisms would also arbitrate in case of dispute over budgeting anthropogenic sources and sinks.

It is not necessary to allow for crediting of sink enhancement or emissions reduction within other countries, known as Joint Implementation, since this can effectively be achieved through the emissions quotas trading system (section II.A.1).

This proposal completes the procedure for applying "contraction and convergence".

II. Draft proposals to achieve contraction and convergence

A. Related tasks for control of greenhouse gas emissions

1. Set up a system for emissions trading

Establish mechanisms for real-time emissions trading between parties to the Protocol under strict conditions of contraction and convergence. Trading shall be restricted to a proportion of the annual emissions quotas, defined as permits, and limited to one year in advance. The mechanism should be transparent and avoid financial feedbacks that would undermine the ultimate aim of the Convention and its protocols.

RATIONALE AND POLICY IMPLICATIONS

The criteria for a trading regime should set out the basis on which possible trading regimes will be assessed. These will inevitably need to balance the different interests and needs of parties to the Convention. In deciding on a suitable mechanism, parties should consider the work already done by UNCTAD in this area and continue to involve it in the development thereof.

A trading regime would initially be developed under the SBI which would continue to supervise the process for CoP. However, once agreed, emissions trading would require a set of robust institutions capable of acting on behalf and under the supervision of CoP. Trading must be open, transparent, efficient and well regulated. The regulatory bodies must also ensure that TEPs are not bought or sold under coercion of any kind.

Emissions trading would also address the issue of "carbon leakage" to countries with relatively lower emissions. This would particularly be the case if purchasing rights of permits were extended to TNCs.

As the mechanism comes into effect, Joint Implementation will no longer become an issue as the trade will help to redress emission imbalances, while the incentive to invest in climate friendly technology remains by releasing quotas for trade.

The mechanism must also ensure that trading is developed primarily as an efficient means of reducing emissions and must not compromise future generations on the principles of inter-generational equity. The implications of this international trade on intra-national equity will also need to be examined and addressed. The increased value of emission quotas from international trade must not detrimentally affect the disadvantaged in national societies. 'Contraction and convergence' applies within countries as well as between them.

Given the historic link between growth of monetary GDP and CO₂ emissions, there is a danger that trade in CO₂ quotas and any other increase in financial activity as a result of this Protocol will simply increase global purchasing power leading to an increase in CO₂ emissions. This would be contradictory to the purpose of the Convention. Another danger is that trade in Emissions Quotas increases inter-national financial liquidity to produce inflation or other instability, as occurred following the OPEC oil price rises. These dangers might be addressed by the creation of a carbon-free "green currency". A study of the potential of carbon-free currency should be commissioned for consideration by CoP in future.

Moreover, existing purchasing power disparities between developing and developed countries can only be aggravated by creating a trade mechanism which continues to exploit the arbitrary advantage enjoyed in the international markets of economies based on hard currencies. This is especially relevant in view of the fact that it ignores the much higher efficiencies of soft currency based economies when national dollars-per-ton efficiencies are adjusted for purchasing power parity (PPP).

2 Require International Airline and Shipping companies to purchase CO2 emission quotas.

CO2 emitted by all aircraft or shipping must be accounted for within the global emissions budget by requiring international transport companies to purchase emissions permits.

RATIONALE AND POLICY IMPLICATIONS

Currently, aircraft on international flights, or shipping in international waters, can purchase untaxed fossil fuel which is not included in any national carbon account. Air transport in particular is one of the fastest growing sectors of global CO2 emissions, and must be constrained in a similar manner to other carbon intensive economic activities. Fiscal measures which might achieve this, such as an international tax on bunker fuels, would require a global authority to predict and control demand. On the other hand, if airline or shipping companies have to purchase emissions permits the market will ensure a "level playing field" with land-based transport.

This measure will also ensure that all emissions are constrained within the contraction / convergence global budget (sections I. 3,4,5), whilst the price of the quotas is passed on to the consumer of the transport, rather than becoming the responsibility of governments.

It may be possible to extend this option to purchase emissions quotas to other Trans National Corporations (TNCs). This would have the advantage of discouraging "leakage" or carbon-intensive production to countries where emissions are cheaper, since the TNCs could purchase emissions quotas from countries with a surplus, without needing to relocate.

3. Consider national targets for anthropogenic emissions of other greenhouse gases

Draw up a timetable for agreeing constraints on concentrations of greenhouse gases other than CO2, with specific targets for each gas, as scientific knowledge of their biogeochemical cycles becomes sufficiently reliable. The allocation of budgets should be based on the same task of equity as used above for CO2, whilst giving special consideration to each country's need to exploit its natural resources and agriculture.

RATIONALE AND POLICY IMPLICATIONS

Concentrations of greenhouse gases other than CO2 are rising fast and must be brought under the FCCC. Gases with similar sources and atmospheric lifetimes may be grouped together and some substitution of these may be possible within the national budgets. Some international trading of emissions quotas may also be considered. However, agreement on one greenhouse gas should not be delayed whilst awaiting better knowledge of the other greenhouse gases.

Greenhouse gases other than CO2 fall into two main categories:

For wholly man-made gases such as most CFCs, HCFCs and SF6, an early agreement could be reached. Production of some of these gases is already constrained under the Montreal Protocol for protection of stratospheric ozone. Their major sources and sinks are already sufficiently quantifiable. National budgets for these gases should be allocated using the same principles of "contraction and convergence", allowing for trading if necessary, as outlined for CO2 in Sections I.2 through to I.5 above. Some of these gases have long lifetimes, and therefore their Global Warming Potential relative to each other is effectively independent of the time horizon used. These gases could be substituted within national budgets.

However, on the basis of inter-generational equity and long-term sustainability, production of the very long-lived gases should be tightly constrained and phased out as soon as possible. If a time horizon were agreed, the global emissions budget for the shorter-lived gases could be linked to that for CO₂ by means of their Global Warming Potential (defined by IPCC).

Methane (CH₄) and Nitrous Oxide (N₂O) are significant greenhouse gases produced by a mixture of anthropogenic and natural sources. The sources and sinks are still poorly defined. Methane emissions are rapidly increasing both as a result of changing agricultural practice (cattle, irrigation) and leakage from natural gas installations. However, Methane has a short atmospheric lifetime and therefore it is not helpful to define a Global Warming Potential relative to CO₂. To account for the greater potency of Methane as a greenhouse gas, international standards of best practice should be agreed for industry and agriculture. Financial penalties collected when these standards are breached, could be used to fund the development and transfer of improved technology to reduce Methane emissions.

Nitrous Oxide has a longer lifetime than Methane but makes a smaller contribution to current global warming, and is less well understood. More research is urgently needed on the cycles of both of these gases.

4 Devise potential sanctions, penalties, and compensation.

Request the Secretariat to draw up options for a system of proportional progressive sanctions and penalties for non-compliance with the protocol, taking account of experience of international, regional and national legal instruments and the review of selected non-compliance, dispute resolution and implementation review procedures (FCCC/CP/1995/Misc.2) prepared by the interim secretariat.

Income raised from penalties could contribute to measures to aid implementation and relieve damages, as listed in Section II.B.3 below.

RATIONALE AND POLICY IMPLICATIONS

There are at present no incentives to comply with the FCCC or the protocol. By contrast, the 1994 GATT agreement contains extensive procedures for dispute settlement, including conciliation, mediation, arbitration, establishment of panels, rights of third parties, remedies, and compensation.

Penalties should be in proportion to excess emissions of greenhouse gases, and considerably higher than the current purchase price of tradable emissions entitlements or investment benefits from the excessive CO₂ emissions.

The virtue of a tough system of penalties is that it will encourage compliance and reduce the likelihood of it being used.

B. Tasks on climate damages

1. Monitor climate damages

Require Parties to prepare an inventory of damages and damage trends, both past and present, directly attributable to climate change. These should include human health and mortality, economic impacts, loss of habitats, species and biodiversity, impact on agriculture, and coastal erosion.

RATIONALE AND POLICY IMPLICATIONS

Damage due to climate change has already begun and estimates of possible future damage, casualties and refugees have been made. The aim of this measure is to compile a comprehensive database of damages which would provide both a benchmark for the danger indicators proposed in proposal 2 above.

Research on climate-related damages should be funded by an international programme whose emphasis should be on impacts to developing countries.

Data on damages should be presented in their original units rather than using monetised values. Such values based on the method of "willingness to pay" imply rights by income which is fundamentally inequitable. International aggregation of damage data for the purpose of a global cost-benefit analysis is not appropriate, since the majority of damages will be inflicted on developing countries whereas most of the CO₂ emissions, and hence mitigation costs, are currently the responsibility of the industrialised countries.

2 Plan for emergencies

Require all parties to draw up contingency provisions for future emergencies which may arise from climate change, such as flooding, drought, crop failure or disease.

RATIONALE AND POLICY IMPLICATIONS

Damage due to climate change has already begun and estimates of possible future damage, casualties and refugees have been made. These should be updated regularly as a basis for arranging emergency relief and compensation payments. Liability for compensation payments is considered in Section II.B.3.

Contingency plans should be also prepared for the potential relocation of entire populations from small island states and low-lying regions to the territory of Annex 1 countries.

3. Consider options for damage compensation and historic debt.

Request that the Secretariat prepare a study of options for damage compensation due to climate change based on best practice in insurance and national compensation schemes, and for historic debt in relation to emissions by Annex I countries prior to 1990, for consideration at CoP4.

RATIONALE AND POLICY IMPLICATIONS

Insurance companies and governments are currently making large scale payments in respect of damages caused by asbestos, radiation and other anthropogenic causes. European and US law also include provision for civil, statutory and criminal liability for environmental damage. Countries and companies which emit CO₂ above the danger level should be under no illusion that they can avoid paying for damage caused by excess CO₂ emissions, thus increasing incentives to comply with the Convention and Protocol. Careful consideration needs to be given to historic emissions when foreseeability of damages could not reasonably have been expected and the precedents under tort thus become less relevant. The argument of historic debt, nevertheless, still holds as developing countries will, in future, not have the option of unrestrained emissions on which developed countries based their historic growth.

For these reasons, Annex 1 Parties should be required to make provision for climate change related damages in their national budgets and planning mechanism.

CO₂ has a long lifetime in the atmosphere, and historic data shows that a constant fraction of emissions has remained airborne, although there is no guarantee for this fraction to remain constant in the future. Therefore, to a first approximation, a country's responsibility for global warming depends on its cumulative emissions integrated over time. Industrialised countries have thus accumulated an historic debt compared to developing countries. Applying the principle of per-capita equity to historic data, it is possible to create a formula for calculating cumulative debits or credits, which might be used for allocating damage liability.

An international panel should be set up by SBSTA to resolve disputes over damage claims; this should include advice from both climate scientists and insurance experts.

For the purpose of such calculations, estimates of cumulative emissions of CO₂ should include historic deforestation and other land use changes. Some countries have preserved much of their natural forest resources, whereas others have exploited them and consequently have more land on which to replant new forests. For consistency in accounting, it is necessary to include this form of historic debt if national emission entitlements are to be based on net anthropogenic emissions (i.e. including changes in natural sources and sinks).

C. Tasks on Policies and Measures to aid implementation

1. Establish financial mechanisms to aid implementation

The SBI shall establish mechanisms by which money can be reliably collected and distributed for global programmes to implement the Convention. Decisions on spending shall be made through a fair and transparent mechanism accountable to CoP.

Funding is required for the following:

Climate Research (see section II.D.2)

Education, training and awareness (see section II.D.1).

Monitoring climate damage (see section II.B.1).

Technology Transfer (see section II.C.2).

Activities currently funded by the GEF

Administration of the CoP and the Secretariat

Administration of emissions trading (see section I.7 and II.A.1)

Emergency Relief and Damage Compensation (see section II.B.2 and II.B.3)

Funding sources may include:

A tax on trading of emissions entitlements (as in section II.A.1)

Penalties for non-compliance (as in section II.A.4)

According to cumulative historic debt (as in section II.B.3)

RATIONALE AND POLICY IMPLICATIONS

Activities which are critical to the success of implementing the Convention, should be able to rely on secure funding. This is already required for the Financial Mechanism under Art. 11 of the FCCC, and the commitments set out in Art. 4 c, d and h. However, present arrangements are unsatisfactory as funds are reliant on the goodwill of a few Parties which then control their use. Binding mechanisms must be set up to enable money to flow directly from the cause of the climate change problem (i.e. greenhouse gas emissions) towards funding its solution. This would encourage a reduction in CO₂ emissions, although the main mechanism for achieving this should remain the allocation of emission entitlements according to Contraction (section I.3) and Convergence (section I.4).

Liability to pay compensation for damages should be linked directly to cumulative historic debt as outlined in section II.B.3.

2. Establish mechanism for development and transfer of sustainable technologies

The development, diffusion and use of the most sustainable technologies, practices and processes which minimise greenhouse gas emissions shall be regarded as an essential global security interest as defined in section I.1. To this end, a mechanism should be established under the protocol to aid the development within and transfer to developing countries of sustainable technologies.

The transfer of outdated or second-hand, carbon-inefficient technology should be controlled and preferably prohibited.

RATIONALE AND POLICY IMPLICATIONS

Explicit measures and positive incentives are urgently needed to stimulate the development and transfer of the most climate-friendly sustainable technology. Such technology should:

- (a) be carbon efficient or based on renewable energy sources
- (b) be an appropriate scale for the local community which it serves
- (c) be independent of expensive supplies or repairs from distant companies.
- (c) not damage the local environment (as do, for example, large hydropower schemes)
- (d) not entail unacceptable risk (as do nuclear power stations)

Measures to stimulate the development and diffusion of climate-friendly technology would include

- (a) establish a technology transfer fund (paid for according to section II.C.1)
- (b) fund research, development and diffusion of sustainable technologies, particularly in developing countries
- (c) create an international inventory of climate-friendly technology
- (d) promote best practice and sharing expertise between countries
- (e) identify gaps and opportunities in national and multilateral technology programmes
- (f) limit the period for which patents on relevant technologies may be held without being exploited for the benefit of humanity

A substantial transfer of outdated, carbon inefficient technology from developed to developing countries is currently widespread. This has the effect of prolonging the detrimental contribution of this machinery or technology on global carbon emissions.

3. Phase out fossil fuel subsidies

Agree mechanisms to phase out all subsidies for fossil-fuels. Transitional procedures and financial support shall be made available to developing countries in order to achieve a smooth transition and avoid penalising the poor.

Rationale and policy implications

Subsidies for the use of fossil fuels both increase global warming and distort the efficient allocation of resources through markets. Definitions of subsidies should be carefully established and the needs of the poor fully taken into consideration.

4. Require consistency in international policy-making

Set up an international task force to ensure that all international agencies, treaties and agreements actively contribute to reducing CO2 emissions as an essential global security interest. This should be backed by a resolution to the United Nations General Assembly to require all international agencies, treaties and agreements take the climatic implications of their actions fully into account and to support the implementation of the UNFCCC and its protocols.

RATIONALE AND POLICY IMPLICATIONS

There is a danger that trade liberalisation under the 1994 GATT agreement, investment by the World Bank and economic measures by the IMF and central banking system as well as actions by other agencies increase CO2 emissions or otherwise undermine the objectives of the FCCC. The aim of this task is to ensure that all international decision-making takes full account of the Climate Convention. A precedent for this task was established by the Ministerial Declaration on the Contribution of the World Trade Organisation to Achieving Greater Coherence in Global Economic Policymaking of 15 December 1993.

5. Establish a forum for local governments

Recognising the important contribution local governments make in implementing climate friendly policies and technologies at a local level, an international forum on climate change for local governments should be established with rights of representation as an observer to CoP under Art. 7 (6). The role of this forum would be to allow sharing of experiences and making relevant policy recommendations to national governments and CoP. This body could also discuss issues of intra-national equity arising from the restraint of carbon emissions.

RATIONALE AND POLICY IMPLICATIONS

A considerable proportion of sustainable policies and technologies are most effectively implemented at a local level and local governments can, therefore, play an important role in emissions reductions. The exchange of information on a local level would complement the transfer of technology on a national level as outlined in Section 2.9. The forum would also be the ideal organ to voice any problems of intra-national inequities arising from national and international implementation of the protocol and specifically the trade mechanism.

D. Tasks on research and education

1. Enhance education, training and awareness

Require all Parties to increase their commitment to education, training and public awareness of climate change under Article 6. This should encourage an holistic perspective emphasising the links between local and global processes, both natural and economic, and convey the full scale of the climate change problem as a survival issue. This must be underpinned by better understanding of the basic science of climate change.

Commission a feasibility study to establish options for an international system of greenhouse gas labelling to provide immediate public awareness of the extent to which a particular product or service contributes to emissions of CO2 or other greenhouse gases and to create incentives to reduce carbon consumption.

Require parties to report annually to the CoP on the following matters:

- (a) the extent and nature of education, training and public awareness undertaken;
- (b) organisation, finance and target audience thereof;
- (c) independent evaluation of the effectiveness of such education and training;
- (d) results of an independent poll of public awareness of climate change, its effects and measures needed to reduce emissions to a sustainable level;
- (e) progress on greenhouse gas labelling
- (f) actions to curb promotion of carbon consumption.

RATIONALE AND POLICY IMPLICATIONS

Most countries have done relatively little to fulfil their commitments under Article 6 of the UNFCCC. Raising awareness of the way in which fossil fuels and other products increase global warming has a significant role in motivating individuals, companies and countries to reduce such consumption. If all goods and services carried a conspicuous and unambiguous statement of the CO₂ or other greenhouse gases emitted by their production and disposal, this would enable people to make more informed choices. Public awareness and education on global warming is in constant competition with the advertising power of the air, car and fossil fuel industries. In view of the gravity of climate change, serious consideration should also be given to measures which curb the promotion of activities responsible for carbon emissions, similar to those currently applied to alcohol, tobacco, pharmaceuticals and other drugs. There is much public confusion over the science and impacts of climate change. This should be tackled both as a core part of school curricula, and as specifically tailored training programmes for employees, stressing measures for alleviating impacts of their field of work on global climate change, and vice versa.

2. Strengthen climate research, particularly into feedback processes

Increase research into physical, biogeochemical, social and economic climatic feedback processes. Such research requires international consistency to ensure that the different processes can be combined in integrated models, whilst also encouraging researchers to investigate new processes. This should be co-ordinated principally through the International Geosphere Biosphere Programme (IGBP) and World Climate Research Programme (WCRP). IPCC and SBSTA (when calculating the emissions ceiling according to section I.2) should attempt to take account of the cumulative risk from low-probability positive feedbacks. When IPCC presents predictions or scenarios of global climate changes, there should also be less emphasis on global average temperature trends, and more on regional differences, particularly regarding the sulphate aerosol effect.

RATIONALE AND POLICY IMPLICATIONS

There are particular dangers that the effects of climate change may trigger uncontrollable feedback loops that accelerate global climate change further than would be expected from current IPCC predictions, and exacerbate regional anomalies. Some known examples of such natural climatic feedback processes are listed below:

- a) Clouds: Different levels of clouds can have opposite effects on climate, since they both trap terrestrial radiation and reflect solar radiation. Clouds and water vapour also transport much latent heat. Thus it is difficult to resolve the feedbacks. Clouds may also be seeded by sulphate aerosols, both natural and anthropogenic.
- b) Ice sheets: Polar warming may increase ice melt, but also increase snowfall. This affects:
 - * Global albedo (proportion of sunlight reflected to space)
 - * Sea level
 - * Local ocean salinity and albedo and hence circulation and ecology
- c) Ocean circulation:
 - * Arctic warming or increased freshwater input to the North Atlantic (ice melt, rainfall) could halt deep water formation, weaken the North Atlantic Current, and thus make NW Europe much colder.
 - * Increased frequency of El Nino circulation in the Pacific affects climate world-wide.
- d) Ocean ecology: Changes in phytoplankton ecology might be caused by:

*increased stratification of the water column, due to surface warming. would reduce nutrient (Nitrate, Phosphate, Iron) supply from bottom waters.

* increased nutrient runoff from rivers due to changing land-use.

* increased UV-B flux due to stratospheric ozone loss.

The effect of this might be to change:

* the export of Carbon from surface water to deep water by the "biological pump".

* the alkalinity of surface water due to calcifying algae. Calcification puts CO₂ back into the atmosphere.

* the production of greenhouse gases (N₂O, CH₄, other hydrocarbons)

* the production of Dimethyl Sulphide which (as sulphate aerosols) seeds clouds over the ocean and thus significantly influences global albedo

* ocean fish stocks

e) Terrestrial ecology: warming and drying in high latitudes may cause:

* release of greenhouse gases CH₄ and N₂O from melting permafrost

* release of CO₂ from peat bogs, if drying allows aeration.

* increased forest fires and subsequent CO₂ release

* reduced snow cover, particularly if forest replaces tundra, with consequent change in albedo.

The "CO₂ fertilisation effect" may cause:

* increased CO₂ uptake by terrestrial vegetation

* changes in evapotranspiration and hence local rainfall and groundwater.

Vegetation changes will affect albedo and also surface roughness which affects wind.

f) Flooding of coastal wetlands by rising sea level, particularly in the tropics, may cause substantial release of CH₄ and N₂O.

There is presently much confusion among policymakers about the cooling effect of sulphate aerosols produced by fossil fuel combustion. It should be stressed that the aerosol effect is short-lived and local, whereas the warming by CO₂ is long-lived and global. Such differences are obscured by an emphasis on global average temperature trends, which should be remedied within IPCC.

3. Study the responsibilities of trans-national corporations and finance

Set up two working groups to examine the role of international finance and transnational corporations respectively in relation to CO₂ emissions, in order to report on

(a) the extent to which their activities contribute to or abate global warming

(b) differential responsibilities between corporate sectors

(c) examples or models of good practice in regulation, incentives, statutory or voluntary codes, reporting requirements or other measures for encouraging corporations and investment fund managers to cut CO₂ emissions

(d) the contribution or otherwise of small and medium businesses to global warming

(e) recommendations for specific measures to enhance the contribution of investment finance and transnational corporations to stabilising CO₂ emissions

RATIONALE AND POLICY IMPLICATIONS

Representatives of transnational corporations are active participants in the climate change negotiations and major players in both sustainable and carbon energy industries. The majority of world trade and a substantial proportion of global production is conducted by transnational corporations, while international financial flows are the driving force in trade and industry throughout the world, often more powerful than governments. The aim of these two study groups would be to examine the specific role of these two major types of economic agents to identify measures to enhance their contribution to stabilising greenhouse gas emissions.