

Deutsche Gesellschaft für
Technische Zusammenarbeit (GTZ) GmbH

commissioned by:



**Federal Ministry
for Economic Cooperation
and Development**

Published by:
Deutsche Gesellschaft für
Technische Zusammenarbeit (GTZ) GmbH
Postfach 51 80, D-65726 Eschborn

Division 44 - Environment and Infrastructure

in cooperation with

Wuppertal Institute for Climate, Environment and Energy, Germany
Energy Research Centre (ERC), University of Cape Town, South Africa

PN 2001.2184.8

Climate Protection Programme

South-North Dialogue on Equity in the Greenhouse

A proposal for an adequate and equitable global climate agreement

Mai 2004

FOREWORD

The GTZ is supporting developing countries in implementing the UN Framework Convention on Climate Change through its Climate Protection Programme (CaPP) and other bilateral projects, all financed by the German Federal Ministry for Economic Cooperation and Development (BMZ). The CaPP focuses on country- and regionally oriented activities concerned with the mitigation of greenhouse gas emissions and adaptation to the adverse effects of climate change. However, methodological issues and climate policy are also addressed in various individual CaPP-supported projects. CaPP was thus able to respond favourably to a request from the Energy Research Centre (South Africa) and the Wuppertal Institute for Climate, Environment and Energy (Germany) for support for a South-North dialogue project. The subject was a framework for future climate negotiations. This dialogue involved researchers from all over the world, with the majority coming from developing countries.

It was the understanding of the researchers from the outset that equity needs to be fully reflected in a future climate change regime. Accordingly, the project was entitled "South-North Dialogue on Equity in the Greenhouse". Furthermore, four broad themes were identified to reflect the equity dimension of an effective climate change regime:

- a) mitigation and burden-sharing
- b) impacts on climate change and financial transfers
- c) capacity to engage politically and
- d) intranational equity.

The results of the South-North dialogue are compiled in this report. A forward-looking and challenging proposal on how to distribute commitments and responsibilities among a new set of country groups based on the equity concept is presented. We trust that the forthcoming discussion on the future climate change regime will benefit from these results.

I would like to emphasise here that the GTZ and the BMZ played only a facilitating role in this project and in no way influenced the substantial outcome of the South-North dialogue. This is in line with the supporting role of German Technical Assistance in cooperation with developing countries.

The South-North dialogue team of 15 researchers from renowned organisations were guided by Dr. Herrmann E. Ott and Bernd Brouns of the Wuppertal Institute and Harald Winkler of the Energy Research Centre. I would like to commend the whole team for their enthusiasm and hard work throughout the project and the innovative ideas that made this remarkable outcome possible.

To enable the results to be fed into the further discussion on the future climate change regime, the BMZ and GTZ are considering supporting regional workshops in Asia, Africa and Latin America in which the South-North dialogue team has a key role to play.



Holger Liptow
Director
Climate Protection Programme
GTZ GmbH

Steve Bernow (Tellus Institute) who was part of the 'South-North Dialogue' passed away on Saturday, July 5 while on vacation in Croatia. We mourn his loss and the gap that he has left in our midst. At our workshop on 8/9 June in Wuppertal we had a last chance to take advantage of his knowledge, dedication, humour and social intelligence. He will be missed. But we also celebrate his life and his contribution to the debate around equity. May Steve's legacy live on, in one small way, in the work that we continue.

South-North Dialogue team

Acknowledgements

This report is the result of a dialogue project among researchers from all world regions (see Annex 2), coordinated by the Wuppertal Institute (Germany) and the Energy Research Centre (South Africa), with financial support from the German Federal Ministry for Economic Cooperation and Development (BMZ) through the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ). It outlines a framework for future climate negotiations and explores the political conditions required for its promotion, taking into account the current political landscape.

Contents

Abbreviations and acronyms used	IV
Authors	V
Proposal: Towards an adequate and equitable global climate agreement	1
An adequate and equitable global climate agreement	1
Responses to the climate challenge	2
Mitigation	2
Adaptation	4
Recommendations	5
Commitments on mitigation	5
Commitments on adaptation	6
Political leadership	7
Equity in the Greenhouse – the Report	10
1. Foundations	10
1.1 Article 2, adequacy and impacts	10
1.2 Equity	15
1.2.1 Equity imperatives	15
1.2.2 Situating equity in the climate challenge	16
1.3 Sustainable development – framework for mitigation and adaptation	17
2. Responses to the climate challenge	19
2.1 Mitigation	20
2.1.1 Deep cuts in the North	20
2.1.2 Development with low emissions	20
2.2 Adaptation	21
2.2.1 Responses to adaptation to date – Convention, Protocol, Marrakech, Delhi and Milan	21
2.2.2 Adaptation funding	22
2.2.3 Insurance mechanisms	25
2.3 National circumstances, needs and capabilities	25
2.3.1 Annex I / non-Annex I differentiation	25
2.3.2 Differentiation among non-Annex I countries	26
3. Exploring options	31
3.1 Differentiation of commitments and responsibilities	31
3.1.1 Commitments on mitigation	31
3.1.2 Commitments on adaptation	33
3.2 Political leadership	37
3.2.1 The political situation: international stagnation, domestic progress	37
3.2.2 Leadership in the climate regime	38
3.2.3 Leadership strategies	40
References	43
Annex 1: Lists of countries included in country groups	46
Annex 2: ‘South-North Dialogue – Equity in the Greenhouse’: project outline	48

Abbreviations and acronyms used

°C	degree Celsius
AOSIS	Alliance of Small Island States
C	carbon
CAN	Climate Action Network
CCAP	Center for Clean Air Policy
CDM	Clean Development Mechanism
CO ₂	carbon dioxide
COP	Conference of the Parties to the UNFCCC
DCs	developing countries
EU	European Union
G77 and China	Group of 77 and China
GATT	General Agreement on Tariffs and Trade
GDP	gross domestic product
GEF	Global Environment Facility
GHG	greenhouse gas
Gt/yr	Gigatonnes per year
HDI	Human Development Index
ICC	International Criminal Court
IPCC	Intergovernmental Panel on Climate Change
IRENA	International Renewable Energy Agency
LDCs	least developed countries
MOP	Meeting of the Parties to the Kyoto Protocol
NAPA	national adaptation programme of action
NGO	non-governmental organisation
NIC	newly industrialised countries
OAPEC	Organisation of Arab Petroleum Exporting Countries
OPEC	Organisation of Petroleum Exporting Countries
ppm	parts per million
PPP	purchasing power parity
QUERO	Quantified Emission Reduction Obligation
RIDCs	rapidly industrialising developing countries
SB	Subsidiary Bodies (of the UNFCCC)
SCCF	Special Climate Change Fund
SD-PAMs	sustainable development policies and measures
SRES	Special Report on Emission Scenarios
UCS	Union of Concerned Scientists
UK	United Kingdom
UN	United Nations
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
US or USA	United States of America
WBGU	German Advisory Council on Global Change
WRI	World Resources Institute
WTO	World Trade Organisation

Authors

Dr Herrmann E. Ott (Germany)
Wuppertal Institute for Climate, Environment and Energy

Harald Winkler (South Africa)
Energy Research Centre, University of Cape Town

Bernd Brouns (Germany)
Wuppertal Institute for Climate, Environment and Energy

Dr Sivan Kartha (USA)
Tellus Institute / Stockholm Environment Institute-Boston

M J Mace (United Kingdom)
Foundation for International Environmental Law & Development

Dr Saleemul Huq (United Kingdom)
International Institute for Environment and Development

Dr Yasuko Kameyama (Japan)
National Institute for Environmental Studies

Agus P. Sari (Indonesia)
Pelangi

Prof Jiahua Pan (China)
Chinese Academy of Social Science

Dr Youba Sokona (Senegal)
Environnement et Développement du Tiers-Monde

Dr Preeti M Bhandari (India)
The Energy and Resources Institute

Dr Andrzej Kassenberg (Poland)
Institute for Sustainable Development

Prof Emilio Lèbre La Rovere (Brazil)
Universidade Federal Do Rio de Janeiro

Prof A Atiq Rahman (Bangladesh)
Bangladesh Center for Advanced Studies

The authors would like to thank Gamieda Gierdien, Tim James, Kathrin Joester, Sara Moltmann, Pierre Mukheibir, Selly Wane and Thomas Wiechers for their assistance in organizing the project workshops and preparing this report. Many thanks go furthermore to Ogunlade Davidson, Izumi Kubota, Jürgen Lefevere, Fernando Tudela and Claudia do Valle for their valuable contributions during various stages of the dialogue. Finally, special thanks to Holger Liptow for making this project possible and for his substantive contribution in Cape Town.

Proposal: Towards an adequate and equitable global climate agreement

International climate policy is at a crossroads. On the one hand negotiations have reached a deadlock in the past two years as all countries wait for Russia to ratify the Kyoto Protocol. On the other hand there is a lively debate beyond official negotiations on options for the mid- and long-term development of the climate regime, and a growing recognition that such a development is of utmost importance. In the near future, progressive forces in the climate arena should strongly focus on bringing the Kyoto Protocol into force; in the years to come, the crucial issue will be how to design the climate regime so that it effectively combats further climate change without jeopardizing the basic development needs of developing countries. Regardless of when or whether the Kyoto Protocol enters into force, the challenge of future climate negotiations will be to embed the next steps in a long-term framework that aims at an adequate and equitable global climate agreement that takes into account the right to sustainable development of all countries.

A package capable of constituting such an agreement will thus need to meet the key challenges of equity and adequacy. Our proposal examines equitable approaches to mitigation – including both deep cuts in the North, and differentiated mitigation commitments for developing countries. Our proposal further examines adaptation, as no agreement will be equitable or adequate if it fails to incorporate appropriate burden sharing mechanisms to address the needs of those most vulnerable to the impacts of climate change. Such an agreement requires leadership by individual countries and groups of countries. It can also be strengthened by support from non-state actors. The alliance for an adequate and equitable global climate agreement will have to include the EU, key developing countries and civil society actors. With such an alliance leading, it may be possible to bring other non-Annex I parties into the climate regime – a step that has long been recognised as essential.

An adequate and equitable global climate agreement

What is required for a climate regime to be adequate is clearly defined in the ultimate objective of the Climate Convention. Greenhouse gas (GHG) emissions must decline sufficiently to allow atmospheric concentrations to stabilize at a level ‘that would prevent dangerous anthropogenic interference with the climate system’ (Art. 2 UNFCCC), within a timeframe that will allow ecosystems to adapt naturally, not threaten food production, and enable sustainable economic development. However, although ambitious and encompassing, this objective falls far short of being an operational definition, as it is not easily translated into constraints on society’s GHG emitting activities.

Many scientific and political institutions have proposed that the term ‘dangerous’ be defined for purposes of Article 2 as a temperature increase above 2°C compared to pre-industrial levels, including the European Union, the German Advisory Council on Global Change, and the Climate Action Network (for references please refer to the main text after the proposal and the bibliography). In view of the guidance from the Climate Convention, aiming at development below 2°C appears to be reasonable, taking into account the following:

- A temperature rise of 2°C already commits the Earth to significant climate change. Adaptation measures therefore would have to be undertaken, starting in the near-term, which raises the issues of compensation and liability.
- Climate science cannot yet tell us with any certainty that a temperature increase exceeding 2°C will not produce ‘serious or irreversible damage’.
- There is considerable uncertainty in the temperature rise that would actually result, even if our best estimates suggest that we are on a ‘2°C trajectory’.
- It appears possible to embark on this trajectory without prohibitive economic losses.

Therefore, this dialogue assumes such a trajectory as a likely target for addressing climate change. However, the target to stay below a temperature increase of 2°C globally poses an unprecedented global challenge. Rather profound infrastructural transitions would be needed to allow global emissions to peak by 2020. The complexity and cost of this transition increase with each passing year of business-as-usual development, as society continues to invest in capital that embodies a commitment to years or even decades of continued GHG emissions: vehicles with 10 year lifetimes, industrial facilities with 30 year lifetimes, homes and office buildings with 100 year lifetimes, and urban/peri-urban development patterns with almost indefinite lifetimes. Earlier actions pay off in the long run, including change of development paths and consumer behaviour. Facilitating the development of the South along a low-GHG path starting in the very near future is an intrinsic part of meeting the climate challenge. This points to the central role of equity in addressing the climate challenge.

Equity arises in the climate regime with respect to four broad themes. As the need for serious mitigation effort intensifies and as the impacts of climate change become ever more visible, addressing these equity dimensions will grow increasingly complex but also increasingly important for the implementation of an effective climate regime.

- *Mitigation and burden-sharing:* Attaining a 2°C trajectory will require near global participation. Not only must emissions in the wealthier North be curtailed radically, but emissions in the poorer South as well must diverge considerably from a conventional, fossil-intensive and highly GHG-emitting development trajectory. The required global resolve will only materialize, however, if an equitable framework is offered that acknowledges the disparities among nations in (historic and continuing) emissions and levels of development.
- *Impacts of climate change and financial transfers:* The impacts of climate change, which communities are already feeling, will continue to accelerate even if a 2°C trajectory were attained. These impacts will fall disproportionately on the South, while the causes are primarily Northern. This is reflected in the continuing and persistent efforts of the Southern negotiators to make adaptation a priority item on the negotiating agenda, especially since COP 6b in 2001, and this focus will only intensify as impacts are more keenly felt. Equitably addressing this issue will entail provid-

ing resources for adaptation and addressing claims for climate-related damages that warrant relief.

- *Capacity to engage politically:* An equitable process (i.e. procedural equity) is a precondition for an equitable outcome. Yet there are currently vast disparities among the Parties in negotiating strength that preclude an equitable process. The lopsidedness has so far been tolerated because the major obligations of the climate regime to date have fallen on the North. Unremedied, however, these disparities in negotiating capacity will make it increasingly difficult for developing countries to have a sense of ownership of the evolving climate regime. Significant capacity building assistance and resources, well beyond those already provided, will be required if the countries of the South are to engage confidently in the subsequent stages of the climate regime.
- *Intranational equity:* Intranational equity is a cross-cutting theme. Overwhelmingly, equity as discussed in the climate context is implicitly viewed at the international level. However, as the disparities *among* nations are echoed *within* nations, equity issues relating to climate are no less profound at the intranational level. Many of the distinctions made between North and South hide the large differences (and at times, inequalities) within countries.

Responses to the climate challenge

Mitigation and adaptation have been recognized as both being responses to the problem of anthropogenic climate change. However, mitigation is the key measure to address the root cause of anthropogenic climate change, namely GHG emissions. While some adaptation will be necessary to deal with climate change to which the world is already committed, ultimately mitigation is the best form of adaptation. Adaptation will become increasingly difficult (and more costly), the less mitigative action is taken – and some adverse impacts such as the loss of rare species or the melting of glaciers cannot be reclaimed by adaptation measures at all.

Mitigation

The focus of the ultimate objective of the Climate Convention in Article 2, namely ‘to achieve stabilization of greenhouse gas concentrations in the atmosphere’, indicates a consensus among Parties to take action for mitigation. The problem the world is facing is not whether mitigation is important, but who mitigates

and how much. What is required in thinking beyond 2012 is, therefore, further and more systematic differentiation among countries, also in the South. To be both fair and reflective of national circumstances, differentiation should be based on the criteria of responsibility, capability and potential to mitigate. For each of these criteria, we consider specific, concrete indicators to quantitatively capture each country's national situation.

- *Responsibility* has been defined in the Brazilian proposal directly in relation to the contribution to temperature increase. In this analysis, we use the approximation of cumulative emissions of fossil CO₂ over the period 1990 to 2000 as an indicator of responsibility. The relatively recent period avoids 'punishing' countries for historical emissions, when the consequences were less widely known. At least since the IPCC's First Assessment Report in 1990, the implications can be said to be well-known internationally.
- A country may have high responsibility for contributing GHG emissions, but nonetheless be too poor to mitigate. For this reason we include indicators reflecting *capability*. Emissions do not have to be linked to human development, but under given socio-economic and technological conditions, a certain level of emissions will be necessary to guarantee a decent life for poor people. We consider two indicators of capability, the human development index (HDI) and GDP per capita. Countries with higher levels of national income and a higher rank on the HDI would be expected to carry a higher burden of mitigation.
- The *potential* to mitigate can be related to three factors – emissions intensity, emissions per capita and emissions growth rate. A high value for CO₂/GDP would suggest high potential to mitigate. The more efficient an economy already is (lower CO₂ emissions per unit GDP), the less potential there is (at a given cost) to mitigate further through efficiency. However, the level of emissions per capita needs to be taken into account as well. High per capita emissions suggest unsustainable consumption patterns, which should provide potential to mitigate without endangering a basic level of development, e.g. by life style changes. National circumstances such as resource endowments also influence mitigation potential. Finally, the growth rate of absolute emissions gives an idea of whether the rate of increase is still high or has already been curbed.

Deep cuts in the North

Based on the criteria of responsibility, capability and potential, the first level of differentiation contained in the Convention, that between Annex I and non-Annex I, remains valid. As a consequence, it is obvious that emissions reductions in Annex I countries must be strengthened considerably in the period after 2012. Emission targets set by the Kyoto Protocol were only a first step in inflecting the curve of growing emissions, and the next steps must involve much more ambitious targets. Some Annex I countries have recognised the urgency of action and set such targets. The UK's energy white paper 'Our energy future', for example, recommends a 60 per cent reduction of industrialised countries' GHG emissions by 2050, the German Advisory Council on Global Change recommends GHG emissions reductions for industrialised countries by at least 20 per cent by 2020.

Differentiation among non-Annex I countries

Based on the principle of 'common but differentiated responsibilities and respective capabilities', emissions from non-Annex I countries have not been subject to quantitative emission commitments up to now. However, any definition of adequacy consistent with Article 2 of the Convention will require increased mitigation efforts from almost all countries. Emissions from at least some non-Annex I countries will need to start to decrease in the fairly near future to complement the dramatic reductions being undertaken in the North. This is particularly true for newly industrialised and rapidly industrialising developing countries.

In order to take forward the negotiation process, there is a need for further differentiation among developing countries. Differentiating among these countries analytically does not imply that the G77 should not negotiate together, but is intended to outline different implications for taking action on climate change. To be both fair and reflective of national circumstances, differentiation should be based on the criteria of responsibility, capability and potential to mitigate (see above).

For each of the criteria, non-Annex I countries' indicators cover a very wide range of values, usually from very low to very high. Given this diversity of national circumstances, there is little reason to think that all non-Annex I countries would act the same way in responding to climate change. While recognising that the 'G77 & China' bloc remains an important vehicle for solidarity, developing countries will need to identify different forms of climate action for different members.

The analysis here seeks to provide a more analytical base for groupings of (developing) countries by identifying some new groups, such as newly industrialised countries (NICs) and rapidly industrialising developing countries (RIDCs) that are seen particularly important in taking the next round of climate negotiations forward (see Table). Least-developed countries (LDCs) were excluded from the analysis, almost by definition not qualifying as industrialising. All other non-Annex I countries were ranked by an index combining responsibility, potential and capability – equally weighting cumulative emissions per capita, the HDI and an indicator of potential (derived from CO₂/GDP and GHG/capita). NICs were then identified as those countries with the highest aggregate score. Focusing on those non-Annex I countries with a medium index value those countries were defined as RIDCs having relative rapid industrial growth in the last decade and relatively high income. The remaining developing countries were grouped as ‘other developing countries’. Altogether, non-Annex I countries were differentiated in four groups each including countries with similar national circumstances (see Annex 1 for all groups’ compositions). These groupings build the basis for the assigning of mitigation and financial transfer commitments.

Adaptation

Climate change is already underway. Even if efforts to reduce emissions are strengthened, the support for adaptation to the impacts of climate change will have to gain a far more prominent role in the evolution of the future climate regime, as the effects of mitigation measures taken now will not be seen for years to come. The required efforts can build on the provisions included in the Climate Convention. Numerous Convention principles and articles stress the importance of developed country leadership on adaptation. These principles state the need for developed country parties to take the lead in combating the adverse effects of climate change, state the need for the full consideration of the specific needs and special circumstances of developing country parties, and emphasize the role of the precautionary principle in the anticipation and mitigation of the adverse effects of climate change. The Convention also contains a number of specific commitments on adaptation that various categories of countries are to undertake, in keeping with the principle of common but differentiated responsibilities and respective capabilities.

As many developing countries (and their communities) lack the physical, financial, technical and technological

capacity to cope with the adverse impacts of climate change, the main challenge of adaptation policy will be understanding and identifying of adaptation needs and actions given national circumstances and adaptive capabilities. As adaptation activities can be capital-intensive and benefits highly localised and immediate, the real challenge will be the development of secure, adequate and predictable funding streams for priority adaptation needs, as well as equitable frameworks for access to this funding. Related challenges will be the development of strategies to increase the adaptive capacity and resilience of vulnerable countries to projected impacts, and the development of equitable burden sharing arrangements among developed countries for the financing of adaptation needs. Funding for adaptation should be linked to responsibility for the impacts of climate change, to operationalise the polluter pays principle.

Even though the Convention requires developed country parties to provide funding for adaptation, to date the financial mechanism for the Convention (the Global Environment Facility/GEF) has spent only a small fraction (less than 8 per cent) of its funding on adaptation over the last ten years of its existence. In addition to the GEF three distinct funding sources have been created to address adaptation activities: the Least Developed Countries Fund and the Special Climate Change Fund, both created under the Convention, and the Adaptation Fund, created under the Kyoto Protocol. However, current mechanisms for funding adaptation are neither sufficient nor linked to responsibility.

Apart from funds, other (financial) mechanisms need to be established addressing adaptation. Tiered national and regional insurance schemes that utilize traditional insurance mechanisms, collective loss-sharing elements, and global reinsurance mechanisms, may also be useful in addressing the impacts of climate change. These and other innovative risk transfer mechanisms can assist developing countries in managing risk from extreme weather events, aiding recovery efforts and contributing to sustainable development. At the same time, these mechanisms assist in sharing the burden of responsibility for damages resulting from climate change among the broader global community.

Last but not least there is an enormous need for capacity building in developing countries if an equitable framework on adaptation is to be developed. Capacity building is needed at many different levels, and in many different areas, e.g. negotiating capacity, scientific and technological knowledge, public awareness.

Recommendations

On the following pages, the South-North Dialogue group proposes a policy package that offers guidance on the content of a future climate agreement (commitments for mitigation and adaptation activities as well as required financial transfers) and the process of achieving it.

Commitments on mitigation

In the long term, any definition of adequacy consistent with UNFCCC Article 2 will require increased mitigation efforts from almost all countries. Therefore, an expansion of emission limitation commitments will form a central element of any future architecture of the climate regime. This expansion has two elements: deepening of quantitative commitments for Annex B countries and the adoption of commitments for those countries outside of the limitation regime.

Rules for determining mitigation commitments

Based on the three criteria that were applied for the differentiation of countries (responsibility, capability and potential to mitigate), a set of decision rules was developed to determine type(s) of commitments for each of the six groups of countries identified:

- The potential to mitigate determines the amount of reductions to be carried out domestically. A country with a high potential would be obliged to exploit this potential, i.e. to accept commitments to reduce domestic emissions. However, this commitment is in the context of a climate regime where financial and technological resources for mitigation are assured, so the level of mitigation efforts as determined by this rule does not imply that countries would necessarily have to pay for their mitigation efforts themselves.
- The amount a country is obliged to pay toward mitigation is determined by responsibility to mitigate in combination with capability to mitigate. Countries having high capability and responsibility would be obliged to pay for all their emission reductions, and also to provide financial and technological resources for mitigation in other countries with medium/low capability and responsibility.
- Higher levels of responsibility suggest not only a higher level of resources devoted to mitigation, but also a binding legal form of their mitigation commitment. Commitments for those with medium responsibility would be binding only if all 'high responsibility' countries have taken on mitigation and funding commitments, while low responsibility suggests mitigation action of a voluntary nature.

Implications for specific groups of countries

Applying these decision rules to the six country groups results in (strict) reduction commitments for Annex I countries, but also implies quantifiable mitigation obligations for some non-Annex I countries assisted by financial transfers from the North. It is worth emphasising that certainly Annex I countries still must take the lead in combating climate change. However, at least some non-Annex I countries would have to contribute more substantially to global mitigation efforts than they already did in the past. A closer look at the resulting commitment reveals the following (see Table):

- Both Annex I groups – Annex II and others - retain Kyoto-style quantitative commitments, i.e. quantified (absolute) emissions reduction obligations with targets for Annex II countries being more demanding than Kyoto levels. The latter would also be committed to financial and technological transfers to those non-Annex I countries with low-to-medium capability to mitigate.
- Countries belonging to the group of NICs and RIDCs would have to take on quantitative mitigation commitments as well – although subject to the conditionality that all major Annex I countries (including the USA) take on quantified emission reduction commitments and fulfil their commitments to provide financial and technological resources. NIC countries, due to their high responsibility and potential to mitigate, would have absolute limitation or reduction commitments, but also will have access to financial and technological resources (from Annex II countries) to help them fulfil the commitments. RIDC countries would also take on absolute limitation targets, and would have access to an even greater share of resources, consistent with their lower capacities. Regardless of whether the terms of conditionality for quantified commitments are fulfilled, NICs as well as RIDCs would engage in qualitative mitigation commitments.
- Qualitative mitigation commitments (policies and measures) will also be obligatory for the group of 'other developing countries', but quantifiable mitigation commitments for these countries and the LDC group would be not justifiable – and not in line with the decision rules (until their status changes).
- There must be agreed triggers (like 'binding obligations for all major industrialised countries')

that would lead to the start of developing country quantitative emission targets. While these triggers can be quantitatively defined, even more important is getting political agreement on what they should be. They further differ from graduation triggers in that they may include conditions for both developing and industrialised countries.

The approach chosen for differentiation among countries in order to assign different kinds of commitments is not static. As national circumstances in countries evolve over time, the composition of the groups will change. If a country exceeds (or falls below) a certain threshold in all of the three criteria (potential, responsibility, capability to mitigate), it will move from one group to another group and, as a consequence, will have to take on other types of commitments. Countries graduate when their indicators become more representative of the next higher group. Therefore, after each commitment period, the composition of the groups may need to be modified.

Commitments on adaptation

The issue of adaptation to climate change has risen rapidly up the policy agenda, both internationally and nationally. It is clear that much remains to be done to gain a better understanding of the multitude and complexity of issues involved, through research and analysis. It is also clear that far more ambitious efforts must be taken to chart a way forward in addressing these issues both inside and outside the international negotiating process. One observation cannot be refuted: little further progress in the international negotiations can be expected without taking into account the concerns of most of the developing countries, which relate in large part to funding and mechanisms for addressing adaptation to the impacts of climate change.

- *Equity*: Many of the most severe adverse impacts of climate change will fall on the poorest countries and communities. The 'polluter pays' principle enshrined in the UNFCCC makes it incumbent on Annex I countries to build the adaptive capacity of the poorer and most vulnerable countries. The notions of equity and justice must be recognised and applied in future negotiations, with the implications of these key principles reflected in both the decision-making process on adaptation, and in the substance of the decisions taken, with respect to impacts, vulnerabilities and funding for adaptation measures.
- *Capacity building*: There is an enormous need for capacity building in developing countries at dif-

ferent levels and in many different areas if an equitable framework on adaptation is to be developed. Negotiating capacity must be strengthened aiming at (i) building negotiating skills; (ii) building in-country ability to develop negotiating positions based on country priorities; (iii) creating opportunities for interaction between developing country negotiators between international negotiating sessions. Besides, stakeholders involved in sectors that have been identified as vulnerable to climate change require sector-specific capacity building on viable adaptation strategies and options. Similarly, capacity building is needed to sensitise policy-makers to the impacts their decision making may have on adaptive capacity. Last but not least, greater efforts are needed to increase public awareness of both the potential impacts of climate change and possible adaptation options and strategies, to enable decision making at the individual and community levels.

- *Responsibility for funding*: Funding for adaptation must be linked to responsibility for the impacts of climate change. The UNFCCC's 'polluter pays' principle needs to be operationalised for appropriate burden sharing, and existing liability and compensation schemes, e.g. the oil spill and nuclear regimes, may provide useful guidance. Adequate and predictable revenue streams are essential for adaptation funding, and new and additional sources of funding must be identified.
- *Funding mechanisms*: The current rules for funding adaptation through the GEF, which include incremental costs and global benefits criteria for project approval, must be modified to enable adaptation projects to be undertaken that result largely or exclusively in local benefits. The allocation of separate and discrete funds by the GEF for adaptation to the impacts of climate change may facilitate the modification of the GEF's funding strategy. The capacity of countries to access GEF funding for adaptation, to conceive and undertake GEF projects, and to mainstream adaptation into national development all need to be enhanced, and supported through new and additional funding. Activities for external funding need to be practised on a rational basis (e.g. through prioritising actions with adaptation as well as mitigation benefits, and prioritising the needs of the most vulnerable communities). Immediate focus should be given to finalising the negotiations on the SCCF, reemphasizing that 'adaptation to the impacts of climate change' is of 'top priority'.
- *Insurance*: Innovative insurance schemes should be explored and piloted for the management of

climate risks at the local, national, regional and international levels. A variety of alternative insurance schemes and risk transfer mechanisms hold great potential for attracting interest from the private capital markets, for instruments that can be used to address risks related to climate change impacts. Public-private partnerships, between the governments of nations vulnerable to the impacts of climate change and the insurance industry, present useful opportunities to leverage both governmental and private sector expertise to address climate-related risks. The establishment of an international fund to backstop reinsurance schemes, to support private-public partnerships, or to backstop national disaster funds while they are in their infancy, may assist in rendering certain climate risks insurable. Such a fund might also provide necessary support to public-private insurance schemes that link insurance availability with incentives to reduce vulnerability and enhance resilience. These sorts of schemes have already proven quite successful in combining risk transfer with risk reduction strategies in disaster-prone communities (e.g. Turkish catastrophe insurance fund).

Political leadership

While the content of a future climate agreement raises a number of challenges relating to mitigation, adaptation and funding, the process of achieving such an agreement is deeply political and worth detailed analysis. The roles of key players such as the US, the EU, G77 & China, and other parties needs to be analysed with respect to their leadership potential. An alliance of parties – from both South and North – that might champion an adequate and equitable global climate agreement is required.

Experience in international environmental governance indicates that in order to achieve progress in regulation, leadership by a strong country or group of countries is required. The European Union has at different stages of the negotiation process employed leadership qualities, but it lacks a coherent strategy that is persistent over a longer period of time. To lead the process of negotiating towards an adequate and equitable global climate agreement, an alliance between the EU, key developing countries and civil society will be essential. Other industrialised countries like Japan, Canada and those from the Environmental Integrity Group will also have to play an important role. This is required in particular because the US, in 2002, has changed its position from a *laissez-faire* approach to one of oppo-

sition to the Kyoto Protocol. The climate community therefore faces the task of stabilising and evolving the regime – at least for the time being – against the opposition of the world's major player.

Leadership strategies

The USA will not ratify the Kyoto Protocol in the foreseeable future. Even a change in the presidency would not affect the composition of the Senate, which must accept international treaties with a two-thirds majority. However, re-engagement by the US is the key for successful climate policy aiming at the ambitious goal of preventing dangerous interference with the climate system. Since political, diplomatic, or economic pressure from outside might have only minor impact on US policy – internal political processes alone will lead to change. These internal political processes can and should be supported from outside, however. As a first pillar of a successful strategy, alternative avenues of co-operating and engaging with the US outside of the Kyoto regime should be explored. One avenue, which is pursued already, is the engagement of the US in technological enterprises. There are, furthermore, many ways of co-operation with federal and sub-federal actors. Support (and possibly funding) of sub-federal entities like states, local communities, scientific and advocacy groups in the United States has the potential to change the political climate and thus increase pressure at the domestic level. Implementing climate policies at the sub-federal level will further increase the chances of re-integrating the US in the climate regime, since otherwise the implementation gap will increase even further.

A second pillar of a climate strategy in the years to come consists of a firm commitment by all Kyoto Parties towards the Kyoto Protocol and the Marrakesh Accords. This means, first of all, for all countries to prepare implementation of their commitments as if the Kyoto Protocol was in force already. Furthermore, the protocol should form the basis of any negotiations for the time after 2012 and preserving the integrity of the Kyoto Protocol should be the guiding principle even in the case that Russia refuses to ratify.

Third, the EU will have to play an equally strong role as in the past if it wants progress on climate change – and probably more. As experiences with overcoming obstacles in the past have demonstrated, progress in the climate regime was usually dependent on a good understanding between the EU and developing countries. Since COP 8 in New Delhi, diplomatic relations between the EU and developing countries are strained

and need a conscious rebuilding. This requires first of all an open ear for the needs and fears of the South and, second, the willingness to provide substantial financial means for mitigation and adaptation activities. Finally, the alliance between the EU (and other industrialised countries like Canada, Japan) and developing countries needs to be built on the firm recognition that mitigation and adaptation are two sides of the same coin and that none of those efforts will be successful without the other.

Will the EU-25 continue to play a leadership role?

It is not yet discernible what kind of impact the enlargement of the EU in May 2004 to a community of 25 countries will have on its ability to play a strong role internationally. Of course, its economic and political weight will increase along with the increase in population and markets. However, the new member states will add additional interests and thus complexity. In any case it can be expected that the enlargement will have a profound impact on the EU in the years from 2005 – exactly those years where the second commitment period (or an enactment without Russian ratification) must be negotiated.

Fourth, developing countries can only regain their leadership qualities if they rethink their role in the climate negotiations, thus rendering their negotiating position more effective. This concerns individual countries as well as the group as such. The fixation on the bloc of G77 & China – historically with good reasons – has led to stagnation, since the diverging and sometimes conflicting interests of such a diverse group of countries tends to lead to agreement on the lowest common denominator. It is thus of paramount importance to realise these differences and make serious attempts at reconciling and co-ordinating a best possible outcome. Equally important will be careful coalition building within the bloc in order to foster leadership. Such a coalition to support an effective and equitable global climate agreement should include China, India and Brazil, and must be supported by a second layer of rapidly industrialising countries. This coalition would be strong enough to counter obstructionist tendencies by OPEC countries. This coalition would likely receive support from the Alliance of Small Island States (AOSIS), which has a vital interest in a successful climate regime. LDCs share this interest, and would similarly provide support, particularly if greater opportunities are provided for adaptation/sustainable development.

Fifth, there is a range of options for civil society actors to adapt to new challenges posed by the complexity of the climate challenge, accelerating globalisation processes and the unilateral attitude of the USA. The NGO community might attempt to gain increased influence on domestic policy in the US. If it is true that policy change there will have to come from within, the achievement of a more favourable political climate in this one country is a top priority for domestic and international organisations alike. Southern NGOs and Southern civil society are crucial for the future of the climate regime – any support for those groups and individuals enhances the chances to win allies among developing countries. NGOs might play an even more active role in facilitating a rapprochement between the EU and the South. They might furthermore have an important role in the process of differentiation between developing countries. Such a leadership alliance formed by the (enlarged) EU, key developing countries and civil society should be guided by the vision of an equitable and adequate global climate agreement. This will only be reached if both responses to climate change – mitigation and adaptation – (as outlined above) play a prominent role in climate negotiations.

Table: Differentiated commitments for groups of countries

	Annex II	Annex I, but not Annex II	NICs	RIDCs	Other DCs	LDCs
Potential to mitigate CO ₂ /GDP, 2000 GHG/capita, 2000 CO ₂ emissions growth, 1991-2000	Medium Very high Narrow range	Very high High Wide range	High High Wide range	Medium Medium Wide range	Medium Low Wide range	Low Low Wide range
Responsibility to mitigate Cumulative CO ₂ /capita, 1990-2000	Very high	High	High	Low	Low	Very low
Capability to mitigate GDP/capita, 2000 HDI, 2000	Very high Very high	Medium High	Medium High	Medium Medium	Low Medium	Very low Low
Mitigation commitments Type of quantitative commitment	Binding (strict) absolute reduction targets, domestic reduction	Binding absolute reduction targets, domestic reduction	Absolute limitation or reduction targets, domestic mitigation*	Absolute limitation targets, if funding and technology provided from Annex I*	No targets	No targets
Qualitative action			SD-PAMs (obligatory), Sector CDM, Non-binding RE & EE targets	SD-PAMs (obligatory, co-funded), Sector CDM, Non-binding RE & EE targets	SD-PAMs (obligatory, co-funded), Sector CDM, Non-binding RE & EE targets	SD-PAMs (optional, funded), Sector CDM, Non-binding RE & EE targets
Financial transfers to support mitigation activities	High direct payments (out) to non-Annex I.	Low / no payments.	NIC co-funds mitigation, but some transfers from Annex II.	High direct payments from Annex II.	Direct payments from Annex II.	Direct payments from Annex II.

* Targets only could become binding if all major Annex I countries have binding quantified emission reduction obligations.

SD-PAMs: Sustainable development policies and measures (Winkler et al. 2002b). For sector CDM and other approaches, see Baumert et al. (2002).

Data source: UNDP (2003; 2002); WRI (2003).

Equity in the Greenhouse – the Report

1 Foundations

Future negotiations on further action to combat climate change are to be embedded in a long-term framework aiming at an adequate and equitable global climate regime. Equity requires that the obligations assigned to nations for achieving this outcome fairly reflects their radically different responsibilities, capabilities, and potentials to mitigate as well as their rights to sustainable development. Adequacy requires that greenhouse gas emissions decline sufficiently to ‘prevent dangerous anthropogenic interference with the climate system’ (Art. 2 UNFCCC).

1.1 Article 2, adequacy and impacts

Article 2 of the Climate Convention 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.

This is an ambitious, long-term objective, with a concrete component referring to stabilization of GHG concentrations, and a more abstract – but no less important – component referring to ecosystem protection, agricultural viability and sustainable development. Nonetheless, the Article 2 objective falls far short of being an operational definition. It does not explicitly specify what stabilized concentration level should be adopted, what constitutes ‘dangerous anthropogenic interference’, or what time-frame would be consistent with ecosystem preservation, agricultural viability and sustainable development.

It is difficult to define adequacy in terms that can easily be translated into constraints on society’s GHG-emitting activities – in part because there is such a long and indirect causal chain: from such activities, to the build-up of atmospheric GHG concentrations, to radiative forcing, to temperature rise, to ‘dangerous anthropogenic interference’ with the climate system. The definition of adequacy is further complicated by the fact that it inherently entails a long-term perspective whose timeframe has no precedent in other multilateral environmental agreements. This long-term nature of the climate challenge arises from multiple factors: the inertia of socio-economic, technological, and political systems, the long atmospheric residence time of GHGs, the inertia of the climate system, and the widespread, enduring, and unpredictable nature of the ecological and societal repercussions of climate change.

Thankfully, there is no absolute need to precisely define a long-term emissions trajectory and irrevocably commit to it. What is needed in this case, however, are concrete near- and mid-term objectives. Given that we are being forced to make decisions under considerable uncertainty, these near- and mid-term objectives should: (i) be consistent with our current best judgement regarding the mitigation actions that will be needed over the long term; (ii) not preclude courses of actions that might ultimately prove necessary; (iii) be flexible and adaptive, since scientific and techno-economic uncertainties may remain unresolved until long after we need to embark upon substantial mitigation action; and (iv) be coupled with an agreed process for periodically revisiting and revising these objectives as new information becomes available.

Given these requirements, what may climate science as currently understood tell us about a provisional definition of adequacy that can inform our near-term objectives? Four key relevant observations are considered here.

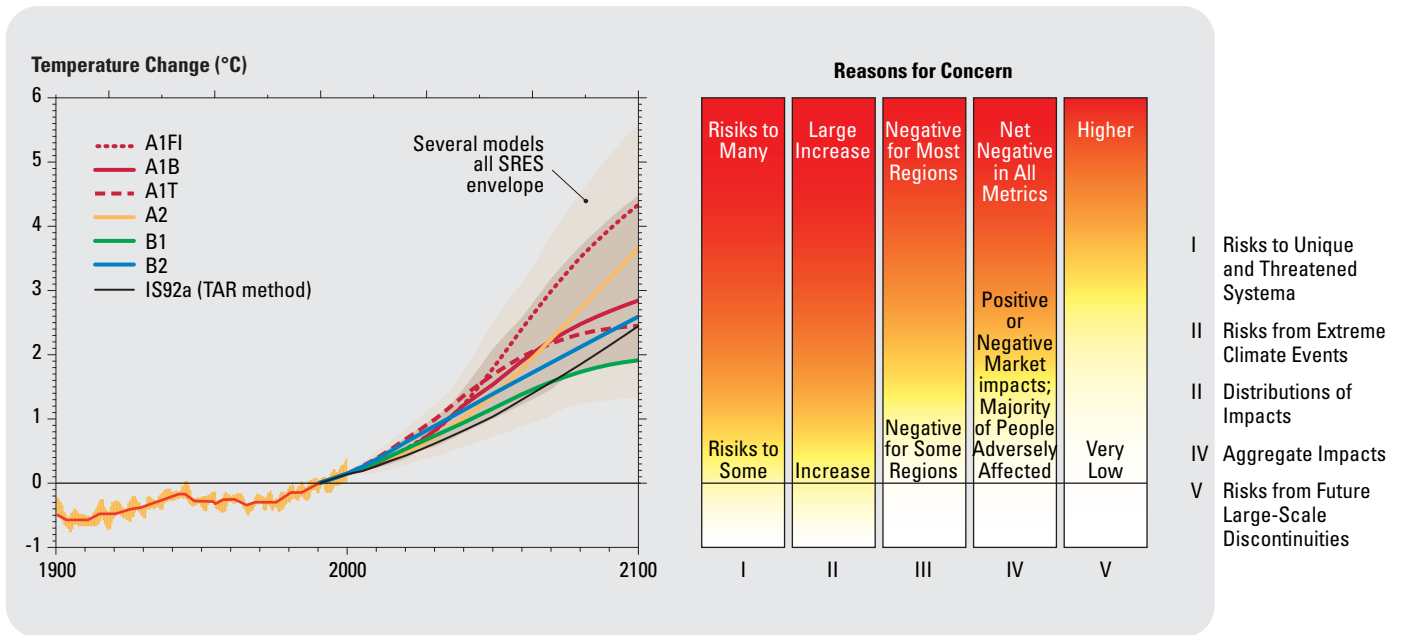


Figure 1: Risks of climate change damages at different levels of global temperature change

Source: IPCC (2001a)

a) Human civilization has evolved during a period of mild and constant climate

Compared to this, the projected human-induced climate change is unprecedented and could cause enormous adverse impacts. Paleoclimatic research tells us that the earth's climate has remained remarkably consistent over the entire time period during which human civilization has evolved. Average global temperature over the millennium prior to the industrial era has varied by only a fraction of a degree. Paleoclimatic research also tells us that dramatic climatic changes—such as the onset of an ice age—are associated with global temperature changes of less than 10°C. In light of this paleoclimatic information, the 21st century warming of 1.4–5.8°C projected for the range of emission scenarios explored by the IPCC clearly presents an unprecedented climatic risk in the history of human civilization (IPCC 2001a).¹ Significant ecological and social damage would occur even at the lower end of the IPCC's range of projected warming. The IPCC analysis of impacts expressed this graphically, as shown in Figure 1.

Of the many existing analyses regarding the impacts of climate change (see IPCC 2001b), highlighting a few representative results will suffice to indicate the magnitude of the threat.

- The viability of key ecosystems is put at risk by a temperature change of only 1–2°C, including coral reefs, arctic ecosystems, and coastal wetlands (IPCC 2001b).
- Recent study of habitats of about 1100 species suggests that a warming of 2°C could lead to the extinction of 24% of species (Thomas et al. 2004).
- A warming of 2.5°C would confront some three billion additional people with water stress. (Hare 2003)
- The Greenland ice sheet, which contains sufficient water to raise sea levels by about seven meters, would become unstable with a local warming of 3°C² (IPCC 2001a).

1 The projected warming is based on diverse families of socio-economic scenarios that assume no measures are taken to protect the climate. It is in addition to the ~0.6° warming that has occurred over the 20th century.

2 Local warming over Greenland is estimated by global climate models to be 1.2 to 3.1 times greater than the global average temperature rise.

Adverse impacts will fall disproportionately on poor, already-stressed communities, because of their higher sensitivity to climate disruptions and lower capacity to adapt, and more limited resources with which to mitigate the impacts.

b) Human activities could trigger abrupt climate change

Paleoclimatic information has also taught us that abrupt climate changes have happened in the past, and that the climate system is inherently chaotic, sensitively balanced, and threshold-laden. Even a slow and gradual forcing can trigger an abrupt shift to a new state at a rate determined by the climate system itself. The paleoclimatic record shows that regional climate has abruptly shifted by as much as 8–16°C in as little as a decade (Alley et al. 2003). Such climatic changes have been linked to shifts in the strength and patterns of the thermohaline circulation (i.e. the global ocean currents, which are driven by temperature and salinity gradients). The thermohaline circulation is already being observed to be affected by ongoing climate change (Dickson et al. 2002).

c) Uncertainty regarding the magnitude of impacts is large and may remain for decades

For a given level of GHG emissions, the resulting amount of warming is not well known. (Conversely, for a given amount of warming, the allowable level of GHG emissions is similarly uncertain.) For example, climate scientists can say only that the amount of warming that would result if atmospheric CO₂ levels rose to twice their preindustrial levels is probably somewhere between 1.5°C and 4.5°C. This is a disconcertingly wide range of uncertainty, given how rapidly adverse impacts mount with increase in temperature.

This broad range in estimates of the climate sensitivity complicates the process of identifying a concentration at which to stabilize atmospheric GHG levels. Global CO₂ emission trajectories, as shown in Figure 2, depend sensitively on the desired stabilization levels. Especially in the case of the lower stabilization trajectories (450 ppm and 550 ppm), global emissions deviate sharply from business-as-usual scenarios, implying significant mitigation activity starting immediately. It is important to note that stabilizing at these levels would mean that mitigation activity would need to start well before the uncertainty in the climate sensitivity has been resolved.

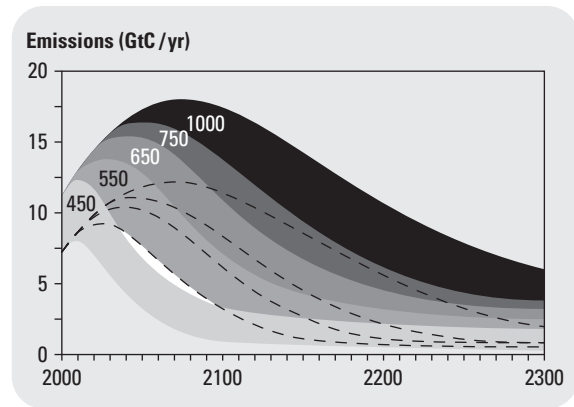


Figure 2: Global CO₂ emission trajectories for different stabilisation levels

Source: IPCC (2001a)

As an example, Figure 3 illustrates how significantly this uncertainty in the climate sensitivity affects the stabilization target that would be required to keep warming within a target of 2°C. The trajectory corresponding to the high-end climate sensitivity of 4.5° is radically lower than the trajectory corresponding to the low-end climate sensitivity of 1.5°. This uncertainty results from the complexity of the various feedback processes that act to amplify the warming influence of GHG increases. We cannot assume that this uncertainty will be resolved in the near future.

d) Dramatic GHG reductions would not be prohibitively costly

Even trajectories that imply dramatic emission reductions do not necessarily imply exorbitant costs. In an analysis that drew upon projections of mitigation costs consistent with conventional macroeconomic analyses, Schneider and Azar (2002) showed that the total cost of mitigation would remain a very small fraction of the growing global economy, as shown in Figure 4.³ The ten-fold increase in the global economy would not be compromised even by the most stringent stabilization targets of 350 ppm, and the point at which the global economy would reach its 2100 level according to business-as-usual projections would be delayed by only a few years.

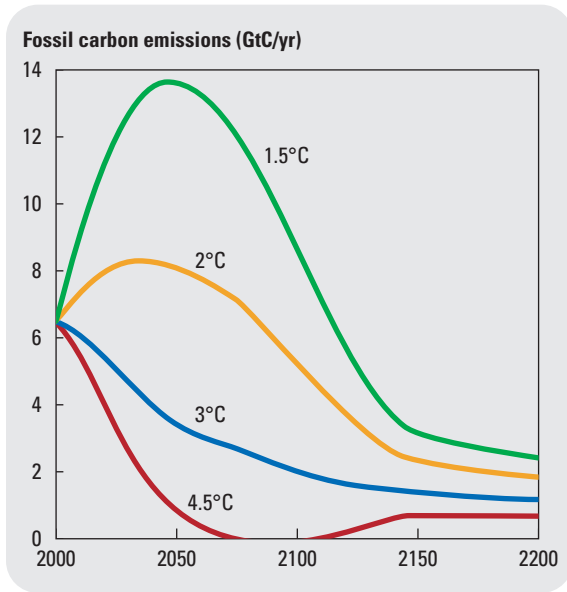


Figure 3: Required CO₂ emissions trajectories for a 2°C target according to climate sensitivity

Source: Caldeira et al. (2003)

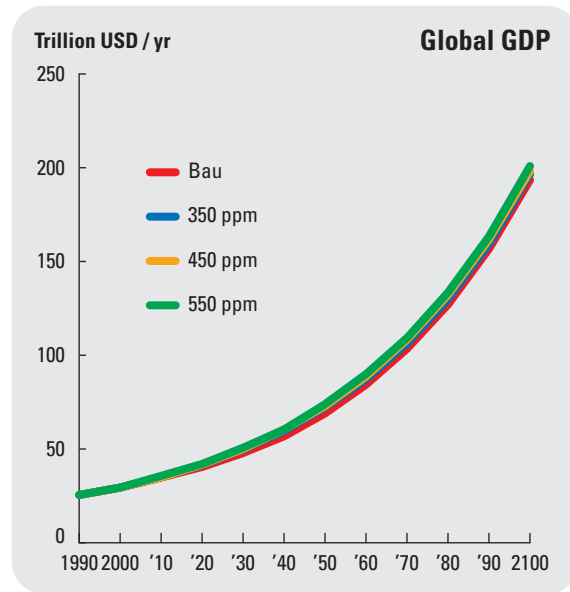


Figure 4: Mitigation costs of different stabilization targets relative to global economic output

Source: Schneider & Azar (2002)

In light of these above four factors, a straightforward cost-benefit analysis is an unsuitable policy tool for defining what is 'adequate' climate protection. First, it is impossible to calculate the costs of a disrupted climate because we cannot with good confidence project the magnitude of the impacts, given the existing climatic science uncertainties. Second, the danger of improbable but catastrophic damages is not dealt with well by cost-benefit analysis, because future risks are discounted to the point of being inconsequential and because the trigger points for the low-probability events are not well understood. Third, even if the damages were well understood, not all costs of climate change can be measured in strict financial terms, since they include damages such as species extinction, loss of human life and adverse human health impacts. Finally, there is no clear way within a strict cost-benefit framework to balance costs and benefits, as those suffering the costs and those enjoying the benefits are separated internationally and inter-generationally.

As an alternative to cost-benefit analysis, many have urged an approach that defines adequacy in terms of

an allowable threshold of warming, which would be reviewed and revised as understanding about the global climate system improves. Figure 5 shows various stabilization scenarios along with best estimates of their resulting global temperature increases, with the ranges given by the uncertainty in climate sensitivity (of 1.5°C to 4.5°C for a doubling of CO₂ concentrations). The line designated (a) shows the range of variability during the millennium preceding the industrial era, for reference. The line designated (b) shows that it is possible to limit warming to 2°C if atmospheric CO₂ concentrations are stabilized at 450 ppm, providing the climate sensitivity turns out to be toward the low end of its range of uncertainty. It also shows that if climate sensitivity turns out to be toward the upper end of its range of uncertainty, that the same 450 ppm stabilization trajectory could result in a global temperature rise exceeding 4°C.

Many scientific and political institutions have proposed that the term 'dangerous' be defined for purposes of Article 2 as a temperature increase above 2°C compared to pre-industrial levels, including the European Union (EU 2002), the German Advisory Council

3 The cost projections were based on pessimistic assumptions in the following sense: (i) they do not count any economic benefits of preventing climate change, (ii) they do not count any ancillary benefits of reducing GHG emissions (e.g. pollution reduction), (iii) they assume for the 550, 450, and 350 ppm trajectories relatively high average abatement costs of \$200/tC, \$300/tC, and \$400/tC, respectively, and no 'no-regrets' abatement options, as is consistent with typical macroeconomic models such as DICE.

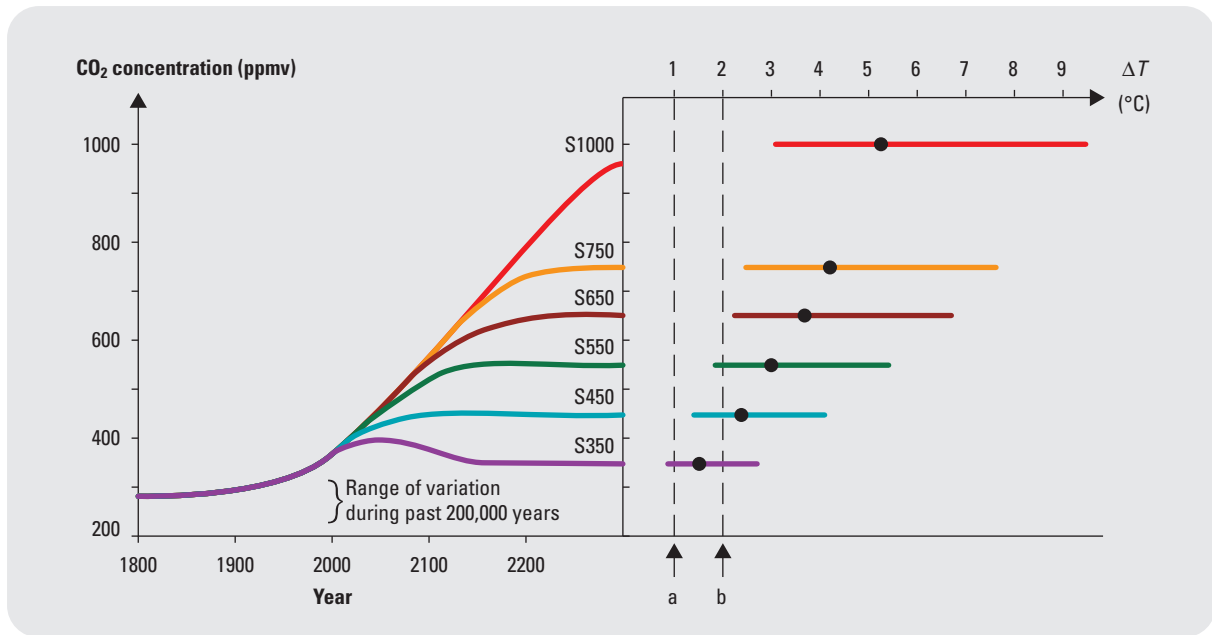


Figure 5: Stabilisation scenarios and resulting temperature increases for different climate sensitivities

Source: Azar & Rhode (1997)

on Global Change (WBGU 2003), and the Climate Action Network (CAN 2002). This is consistent with the precautionary principle as expressed in Article 3 of the Climate Convention:

The Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost.

In view of this guidance, aiming at development below 2°C appears to be reasonable, at least for the meantime, considering the four factors discussed above:

1. A temperature rise of 2°C is highly likely to have significant adverse climate impacts.
2. Climate science cannot yet tell us with any certainty that a temperature increase exceeding 2°C will not produce 'serious or irreversible damage'.

3. There is considerable uncertainty in the temperature rise that would actually result, even if our best estimates suggest we are on a '2°C trajectory'.
4. It appears possible to embark on this trajectory without prohibitive economic losses.

For the sake of argument, let us consider what it would imply if the UNFCCC Parties took the global political decision to strive to limit temperature rise to 2°C. Looking again at Figure 5, we see that the allowed emission trajectory for a temperature rise of 2°C depends strongly on the climate sensitivity. Let us consider also, then, that in the acknowledged presence of this considerable uncertainty, the Parties took the global political decision to embark on an emission trajectory that would be implied by a climate sensitivity of $T_{2x} = \sim 2.5^\circ$ (which is slightly optimistic relative to the current best estimate). This would imply a stabilization level of approximately 450 ppm. A trajectory consistent with this definition of adequacy is shown in Figure 6, along with three of the IPCC's Special Report on Emission Scenarios business-as-usual scenarios for comparison.

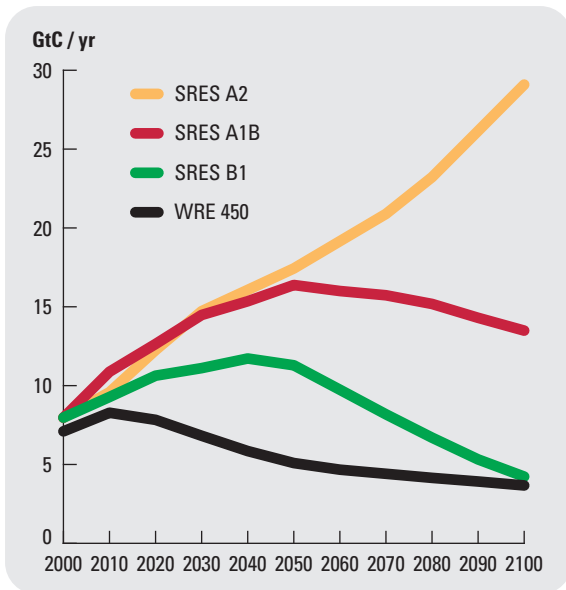


Figure 6: The 450 ppm stabilization path, and a high (A2), mid-range (A1B), and low (B1) Special Report on Emission Scenarios scenario

Source: Based on data from IPCC (1999) and ScenGen model

The 2°C path shows global emissions peaking by 2020 at less than 10 GtC/yr. Two implications of this trajectory should be mentioned. First, this adequacy target does commit the Earth to significant climate change, and carries the risk of severe climate change if the climate sensitivity turns out to be at the high end of the uncertainty range (giving rise to perhaps 4°C temperature rise). Adaptation measures therefore would have to be undertaken, starting in the near-term, which raises the issues of compensation and liability. Second, this target poses an unprecedented global challenge. A rather profound infrastructural transition would be needed to allow global emissions to peak by 2020. The complexity and cost of this transition grow with each passing year of business-as-usual development, as society continues to invest in capital that embodies a commitment to years or even decades of continued GHG emissions: vehicles with 10 year lifetimes, industrial facilities with 30 year lifetimes, homes and office buildings with 100 year lifetimes, and urban/peri-urban development patterns with almost indefinite lifetimes. Facilitating the development of the South along a low-GHG path starting in the very near future is an intrinsic part of meeting the climate challenge. This points to the central role of equity in the climate challenge.

1.2 Equity

1.2.1 Equity imperatives

Equity is fundamental to the climate challenge for four chief reasons.

Legal imperative: Parties are legally bound by the Climate Convention to seek an equitable climate regime, as Article 3 makes clear: ‘The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities.’

Moral imperative: Citizens of a global community face a moral compulsion to engage on the basis of justice and equity. As global interconnectedness grows through globalisation and shared environmental and geopolitical challenges, the moral imperative becomes further strengthened. As our capacity to adversely affect the environment grows global, long-term, and irreversible, this moral imperative has also become further strengthened and extended to future generations.

Political imperative: The climate challenge requires a global effort. The nature of the problem does require some countries to lead and to explore the way into a fossil-free future, but at some point all major polluters of the planet, from North and South, must be part of this effort. However, in most cases countries will only participate if they perceive the climate regime to be equitable.

Practical imperative: The challenge of climate change may only be practically resolvable if equity – in its strongest sense – is addressed. Both pillars of addressing the climate challenge – mitigation and adaptation – rely on a fundamental recognition of equity and sustainable development (see section 1.3). The practical imperative inextricably merges the sustainable development goals of the South with the global climate challenge (Shukla et al. 2002).

It is the last of these four imperatives that is most compelling. After all, countries have been known to abandon international treaties, thus proving the legal imperative weak; countries have so far been unmoved to address global poverty, thus proving the moral imperative weak; and countries are often able to achieve geopolitical objectives through coercive means, thus proving the political imperative weak.

1.2.2 Situating equity in the climate challenge

Equity arises in the climate regime with respect to four broad themes. As the need for serious mitigation effort intensifies and as the impacts of climate change become ever more visible, addressing these equity dimensions will grow increasingly complex and increasingly important for the implementation of an effective climate regime.

Mitigation and burden-sharing

Attaining the trajectory shown in Figure 6 will require near-global participation. Not only must emissions in the wealthier North (Annex I countries) be curtailed radically, but emissions in the poorer South (non-Annex I countries) as well must diverge considerably from a conventional, fossil-intensive and highly GHG-emitting development trajectory. The required global resolve will only materialize, however, if an equitable framework is offered that acknowledges the disparity among nations in historic and continuing emissions. It would also recognize that the world's majority lives in poverty, and relief from poverty entails an increase in energy services and an unavoidable near-term rise in carbon emissions. This is another challenge for the North – to foster low-carbon technology in the Southern hemisphere in order to leapfrog the fossil fuel intensive stage of economic development. The Extractive Industries Review process of the World Bank has shown one way of fostering this development: according to the review, the World Bank should stop financing fossil fuel technologies and divert the money into renewables and efficiency measures (Salim 2003). To be sure, certain near-term carbon reduction measures can also provide development co-benefits. But until a decent standard of living is reached, the world's poor majority will defer investments in ambitious reductions, even as its aggregate emissions grow and exceed those of the wealthy minority.

Any proposed burden-sharing scheme can be examined explicitly and quantitatively in terms of the desired emission trajectory. The trajectories illustrated in Figure 7 show an illustrative burden-sharing arrangement. For simplicity, it aggregates all countries into 'North' and 'South' even though there are clear and important differences among the countries within in each of these admittedly coarse groupings. (In chapters 2 and 3 of this report, more attention is paid to defining useful, operational, disaggregated categories of countries.)

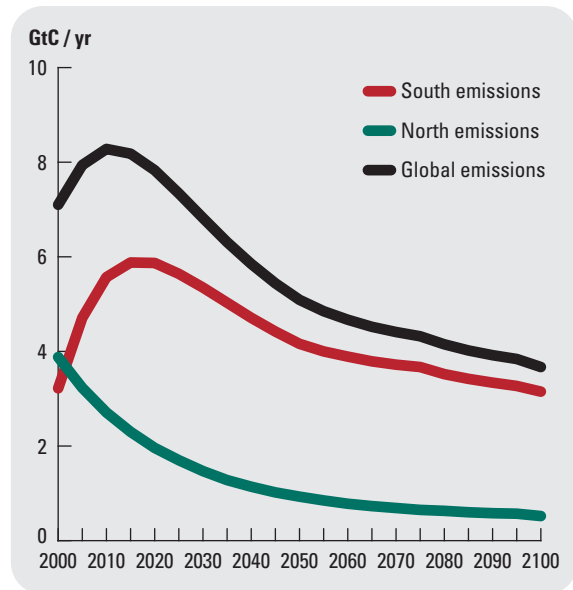


Figure 7: Potential emissions trajectories in North and South consistent with a 450 ppm stabilization path.

Source: Based on IPCC (1999); ScenGen model; UN (2003)

In this burden-sharing agreement, the emissions from the North undergo a steady and rapid decline starting immediately (decreasing by more than half by mid-century, and halving again by the end of the century). The South initially increases emissions, as is demanded by its development needs, and by the century's end reaches the same per capita emissions rate as the North. This suggests two provisional conclusions bearing strongly on the issue of equity:

1. Emissions from the South will need to start to decrease in the fairly near future despite dramatic reductions being undertaken in the North.⁴ Proposals that aim to address equity concerns by offering 'growth-targets' (i.e. allocations that allow continued increases in emissions) for all Southern Parties that last more than a very limited period into the future (about 10 or 20 years) may not be consistent with any reasonable definition of adequacy. This is particularly true for newly industrialised and rapidly industrialising developing countries (see sections 2.3 and 3.1). However, for some least developed countries, absolute emissions are so low that mitigation will likely only be required beyond this time-frame.

⁴ In fact, even if the North just disappeared today along with its vast GHG emissions, the South would still have a major climate problem on its hands and would not be able to continue to increase emissions for long.

2. Additionally, the fact that continued development in the South is a fundamental priority that must not be sacrificed to the requirements of climate protection, presents an extraordinary dual challenge. Substantial financial and technical transfers from the North will be necessary to enable the degree of mitigation effort required in the South to protect the climate while enabling development. In other words, substantial transfers to the South are necessitated by practical considerations of protecting the climate, whether or not such transfers are warranted by equity considerations.

Especially in the context of vastly different negotiating capacities among nations, a continuation of the ad hoc burden-sharing approach exemplified by Kyoto is assured of being inequitable. An equitable approach requires coherent and comprehensible principles, transparently applied. Many have argued that the rights to use the absorptive capacity of the atmosphere should be allocated equally, because emissions of carbon are directly linked to engagement in economic activities and enjoyment of products and services (i.e. carbon is embedded in capital and consumptive goods, given today's technologies), and hence to human welfare. The challenge then is to define a common property management system that distributes equitably the benefits of this common property resource.

Impacts, compensation and liability

Impacts of climate change, which communities are already feeling, will continue to accelerate even if a 2°C trajectory is attained. These impacts will fall disproportionately on the South, while the causes are primarily Northern. This is reflected in the continuing and persistent efforts of the Southern negotiators to make adaptation a priority item on the negotiating agenda, especially since COP 6b in 2001 (see section 2.2), and this focus will only intensify as impacts are more keenly felt. Equitably addressing this issue will entail providing resources for adaptation and addressing claims for climate-related damages that warrant relief.

Capacity to engage politically

An equitable process (i.e. procedural equity) is a precondition for an equitable outcome. Yet there are currently vast disparities among the Parties in negotiating strength that preclude an equitable process (e.g. non-Annex I Parties were not granted sufficient financial resources to ensure that each country can send at least one delegate to attend SB-18 in 2003). The lopsidedness has so far been tolerated because the major

obligations of the climate regime to date have fallen on the North. Unremedied, however, these disparities in negotiating capacity will make it increasingly difficult for developing countries to have a sense of ownership of the evolving climate regime, especially as the impacts of climate change are felt, the mitigation requirements increase, and a broader burden-sharing regime is needed. Significant capacity building assistance and resources, well beyond those already provided, will be required if the countries of the South are to engage confidently in the subsequent stages of the climate regime. An important aspect of this capacity building is to enhance the scientific and technical capacity for assessing climate change, its impacts, and response options.

Intranational equity

Intranational equity is a cross-cutting theme. Overwhelmingly, equity as discussed in the climate context is implicitly viewed at the international level. However, as the disparities among nations are echoed within nations, equity issues relating to climate are no less profound at the intranational level (Ott/Sachs 2002). Many of the distinctions made above between North and South hide the large differences (and at times, inequalities) within these (groups of) countries. Vulnerability is primarily experienced at the local level, implying that resource transfer should aim not only at poor countries, but also vulnerable and poor communities. A specific problem arises in defining a just transition for communities that are dependent for their livelihoods on fossil fuel resources or forestry.

1.3 Sustainable development – framework for mitigation and adaptation

Both pillars of addressing the climate challenge – mitigation and adaptation – rely on a fundamental recognition of equity and sustainable development. Figure 8 gives a way of looking at the overlap between mitigation, adaptation and development (by which is normally meant short-term economic development only) where the interface between the three is rather small. However, if the notion of development were to be broadened to include sustainable development (incorporating both a longer term perspectives as well as non-economic factors) then it is likely that both mitigation as well as adaptation actions will both overlap with each other more as well as with sustainable development.

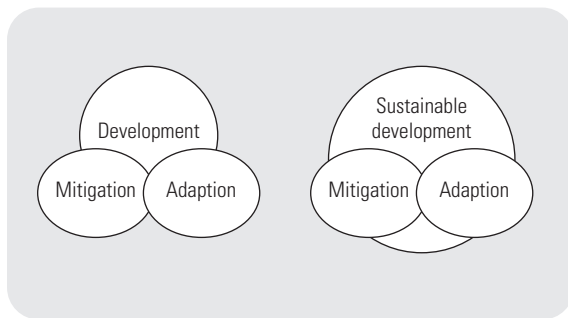


Figure 8: Linking mitigation and adaptation in the framework of sustainable development

Mitigation involves the development and diffusion of advanced technologies, habitat preservation and population stabilization. These aims are impossible to achieve without institutions, policies, and measures that enable economic and cultural development of the poorest and support the legitimate aspiration of people toward enhancement of human welfare. Similarly, adaptation involves creating the conditions for adaptation to climate change, supporting resiliency of local communities by enhancing human welfare, and fostering sustainable livelihoods particularly in the poorest and most vulnerable communities.

For adaptation, the most relevant literature is that which recognises that both adaptation and mitigation do not occur as discrete activities but often occur as part of continuing activities. Countries anyway take measures to cope with natural climate variability, and are continually investing in activities (such as energy supply) that may emit more or less GHGs. Analysis therefore is most realistic when it recognises that many adaptation and mitigation options involve adjusting the orientation of ongoing investment and other activities ('mainstreaming'), rather than being discrete actions with easily separated costs and benefits. Some of the most effective action on adaptation is to support more sustainable development.

Similarly, mitigation approaches that emphasise sustainable development (e.g. sustainable development policies and measures – SD-PAMs) are particularly attractive to developing countries (Winkler et al. 2002b). In meeting basic development needs, different paths are possible, and the aim of SD-PAMs is to shift toward a more sustainable path of development. Such a path, although not motivated by climate policy, will have lower GHG emissions, as shown by the Special Report on Emission Scenarios (IPCC 2001c).

The importance of sustainable development, and its relationship to climate change, has long been recognized in the UNFCCC process. Article 3.4 of the Convention states as a principle that:

Parties have a right to, and should, promote sustainable development. Policies and measures to protect the climate system against human-induced change should be appropriate to the specific condition of each Party and should be integrated with national development programmes, taking into account that economic development is essential for adopting measures to address climate change.

By taking such a sustainable development approach to analysing both mitigation as well as adaptation it should be possible to examine a larger pool of potential win-win options and policies. Both aspects of the climate challenge must be addressed in the context of development.

The literature and scientific analysis on adaptation and mitigation to date has tended to treat them as separate domains, with very little overlap. The main exceptions in the analytic literature have been attempts to construct global 'cost-benefit' analysis. It is difficult to integrate both mitigation and adaptation within a common analytical framework because of the differences in both geographic and time scales relevant to each domain. Mitigation action is needed in the short term to provide long-term benefits (over decades), while adaptation in the near term has short-to-long-term consequences. On geographic scales, mitigation requires local action but has global climatic benefits and local co-benefits, while adaptation is local in terms of both the action and its benefits.

The relationship between adaptation and mitigation needs to be understood not as alternatives, but rather as a mix which will require analysis and judgement to inform the appropriate combination. Nevertheless, in general the more mitigation there is, the less will be the impacts to which we will have to adjust, and the less the risks for which we will have to try and prepare. Conversely, the greater the degree of preparatory adaptation, the less may be the impacts associated with any given degree of climate change. Regionally, the appropriate mix may vary, but almost all regions are likely to be engaged in some of both kinds of activity. A focus on sustainable development provides the basis for such a combination.

To make this practical for the climate negotiations, synergies and trade-offs at local, national and international level need to be identified. There will be a set of developing win-win or synergistic projects, which can address both mitigation as well as adaptation. These are especially evident in the land-use sector where enhancing land-use with tree cover can be both beneficial for mitigation as well as adaptation. However, many projects will be driven by adaptation or mitigation in particular. At the local or project level, one might distinguish between the following:

- *Mitigation-driven actions:* These may in turn either have (a) positive adaptation consequences (e.g. carbon sequestration projects with positive drought preparedness aspects) or (b) negative adaptation consequences (e.g. if heavy dependence on a variable energy source (e.g. wind, hydro, solar) increases the sensitivity of energy supply to weather variations).
- *Adaptation-driven actions:* These may also have both (a) positive consequences for mitigation (e.g. coastal mangrove plantations to build resilience to coastal storms will also sequester carbon) or (b) negative consequences for mitigation (e.g. large dams for water storage, or other large infrastructure projects for protection of people may result in enhanced emissions during the construction periods).
- *Non-climate-driven actions:* In many cases actions will be taken for reasons which have nothing to do with either mitigation or adaptation (i.e. are unrelated to climate considerations) but may have considerable consequences for either (or both) mitigation as well as adaptation (e.g. deforestation for agriculture or other purposes results in loss of carbon as well as loss of ecosystems and the resilience of local populations).

The last category will contain many sustainable development policies. Considering which sectors projects fall into will assist in identifying synergies and trade-offs. Mitigation and adaptation actions and policies within nations relate to inherently different sectors (although there is some overlap). Thus, for example, mitigation actions usually relate to energy, industry and transport sectors in most countries. The most vulnerable sectors (and hence the ones where adaptation actions will need to be taken) are usually the agriculture, land use, forestry, water and coastal zone management sectors.

Since solutions to the climate change problem are pursued internationally through the Climate Convention and with quantified commitments for many industrialised countries through the Kyoto Protocol, it is necessary to analyse the global/international dimension of both mitigation as well as adaptation. Both are response strategies against the problem of climate change.

One notion that underlies much global analysis is to seek a cost/benefit optimum for comparing mitigation against adaptation actions. This is a very difficult notion to determine in the abstract because it involves, *inter alia*, uncertainties on the science and economics of long-term impacts, complexities of risk management, valuation of non-market goods, differences of scale and ethical judgements on 'who pays for what'. The latter issue is particularly complex and sensitive since most analyses envisage that the costs of mitigation will occur (at least initially) in the more developed and richer countries while the costs of impacts (or mitigation in-action) will be borne largely (but not exclusively) in the poorer countries of the developing world.

One of the greatest challenges in the years ahead will be the integration of mitigation and adaptation within a common analytical framework at the international level, and for the development of opportunities for synergistic projects at the local level, oriented towards sustainable development.

2 Responses to the climate challenge

Mitigation and adaptation have been recognized as both being responses to the problem of anthropogenic climate change. However, mitigation is the key measure to address its root cause, namely GHG emissions. While some adaptation will be necessary to deal with climate change to which the world is already committed, ultimately mitigation is the best form of adaptation (Yohe 2001). Adaptation will become increasingly difficult (and more costly), the less mitigative action is taken – and some adverse impacts such as the loss of rare species or the melting of glaciers cannot be reclaimed by adaptation measures at all.

2.1 Mitigation

Mitigation activities means reducing or limiting emission of GHGs into the atmosphere. The focus of the ultimate objective of the UNFCCC in Article 2, namely 'to achieve stabilization of GHG concentrations in the atmosphere', indicates a consensus among parties to take action for mitigation. Therefore, the problem the world is facing is not whether or not mitigation is important, but who mitigates and how much. Long multilateral negotiations in the last fourteen years were mainly on burden-sharing among countries for mitigation, and this will continue to be a central part of debates in future climate negotiation.

2.1.1 *Deep cuts in the North*

Annex I countries must continue to take the lead in reducing GHG emissions, for several reasons that are linked to the criteria outlined in section 2.3. Firstly, from the point of responsibility, Annex I countries are responsible for the majority of GHG emissions in the past, which has caused current climate change. Emissions per capita of Annex I countries are generally much larger than those of non-Annex I countries, which means that individuals living in Annex I countries have more responsibility than those living in non-Annex I countries. From an equity perspective, each individual living today and in the future has a right to use the same amount of service from the atmosphere. It would be patently inequitable if the Annex I countries, by virtue of being wealthier and consuming more fossil fuels both historically and currently, depleted the atmosphere's rapidly diminishing capacity to serve as a safe sink for GHG emissions. Hence, Parties agreed in Marrakesh that Annex I Parties should reduce 'emissions in a manner conducive to narrowing per capita differences between developed and developing country Parties' (UNFCCC 2001a).

Secondly, from the point of capability, most Annex I countries are richer than non-Annex I countries, with the exception of a few newly industrialized developing countries (see definitions in section 2.3). This means Annex I countries have more financial capacity to pay for mitigation measures. Besides, physical infrastructure in Annex I countries is well established and there is less need to use highly energy and carbon intensive materials for expanding housing, roads or other infrastructure.

Thirdly, from the point of mitigation potential, Annex I countries have more 'luxury' emissions, compared to emissions from activities related to basic human needs. For example, reduction of use of automobiles in Annex II countries would have less impact on their basic human needs than reduction of fuel use for cooking in a non-Annex I country.

Despite the moral and practical necessity of reduction, the emissions in many Annex I countries are still increasing. According to the latest compilation of national communications by the UNFCCC Secretariat, GHG emissions from all Annex I countries as a whole (excluding land-use change and forestry) decreased by 6.6% from 1990 to 2001 (UNFCCC 2003a). Thus Annex I Parties have jointly attained the aim of Article 4.2 of the Convention. However, the decrease was mainly due to a 40% decline in emissions from economy-in-transition countries. Emissions from Annex II countries have increased by 7.5% over the decade. In addition, total GHG emissions from Annex I countries are expected to increase by about 10% by 2010 compared to 1990 levels, even with policies and measures (UNFCCC 2003b).

Considering the above-mentioned reasons, it is clear Annex I countries must reduce emissions further. Emission targets set by the Kyoto Protocol were only a first step in inflecting the curve of growing emissions. They should be reconfirmed and strengthened in the period after 2012. Some Annex I countries have recognised the urgency of action and set more ambitious and longer-term targets, e.g. the UK's energy white paper 'Our energy future' recommending a 60% reduction of industrialised countries' GHG emissions by 2050 (UK 2003), or the German Advisory Council on Global Change recommending GHG emissions reductions for industrialised countries by at least 20% by 2020 (WBGU 2003).

In addition to the emission reductions that must occur within Annex I countries, these countries must also provide financial and technological resources to help enable what needs to happen in Non-Annex I countries – development with low emissions.

2.1.2 *Development with low emissions*

Based on the principle of 'common but differentiated responsibilities and respective capabilities', emissions from non-Annex I countries have not been subject to quantitative emission commitment up to now. While the primary responsibility of Annex I countries is widely accepted, it is clear that emissions from

non-Annex I countries have been rapidly increasing. According to data from the World Resources Institute,⁵ CO₂ emissions from fuel combustion in developing countries have increased 38.9% over the 1990-2000 period, resulting in a share of 40% of annual global emissions in 2000 (WRI 2003). At the same time, some non-Annex I countries have also rapidly developed in terms of economy. GDP per capita of NICs such as Singapore, the Republic of Korea and Qatar is getting close to – or exceeding – the level of some Annex I countries. It appears reasonable to assume that responsibility, capacity, and capability of those countries to take mitigation actions are increasing as those countries become further industrialised.

In order for the world to achieve the ultimate objective of the Climate Convention as given in Article 2, it is necessary at least for some non-Annex I countries to start taking mitigation activities to limit their GHG emissions. As non-Annex I countries (other than NICs) are still on their way to meeting the welfare needs of their populations, limitations on emissions must not require sacrificing sustainable development. This implies two things. First, every opportunity should be taken to decouple emission growth from economic growth, by relying on more efficient and lower-GHG technologies and processes, thereby enabling non-Annex I countries to leapfrog the GHG-intensive development path taken by the Annex I countries. Second, to the extent that mitigation activities in non-Annex I countries require additional financial and technological resources, these resources should be provided by those countries who have the capability and the responsibility to do so, i.e. Annex I countries.

A concrete meaning of de-coupling, or development with low emission, will differ from country to country according to their national circumstances, including geographical circumstances and level of economic development. Similarly, the appropriate magnitude of financial and technological resources to enable that decoupling will also depend on national circumstances. There is a large diversity among non-Annex I countries in terms of national circumstances, as reflected in the wide range of values against all criteria shown in Table 1. Each non-Annex I country has its own development objectives and the most suitable way to achieve low-emitting development paths.

In climate negotiations, however, non-Annex I countries seek the solidarity of a consolidated negotiating group called 'G 77 & China'. Given the diversity of this group, it is becoming more and more difficult to achieve a unified position (see section 3.2). Arguably, researchers are more flexible than negotiators to start working on how to adequately reflect divergence of non-Annex I countries into their climate mitigation policies.

LDCs are concerned both with 'development' and with adaptation, with little interest in or responsibility for mitigation even in the medium term. On the other hand, several non-Annex I countries are in a process of rapid industrialization. Some have even reached levels of development that have earned them the title of 'newly industrialised'. Both NICs and RIDCs have been facing various issues such as serious local air pollution, human health hazards, high energy cost, and rapid urbanization. In this context, many mitigation policies will be beneficial to solve local environmental problems, and contribute to sustainable development.

2.2 Adaptation

2.2.1 Responses to adaptation to date – Convention, Protocol, Marrakech, Delhi and Milan

The issue of adaptation to climate change is closely related to the impacts of climate change and hence also to the vulnerability to those impacts. While adaptation has been relatively neglected, as compared to the issue of mitigation, discussions have gained momentum in the last few years. The commitment of the Parties to appropriate responses to adaptation needs is enshrined in the Convention text (see Mace 2003; Verheyen 2002). First, adaptation is part of the ultimate objective of the Convention. It appears in the second sentence (which is often forgotten) of Article 2 as follows (emphasis added):

The ultimate objective of this Convention (...) is to achieve (...) 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*

5 Compilation of all national communication from non-Annex I countries by the Secretariat is not yet available as not all non-Annex I countries have submitted their first national communication.

sufficient to allow ecosystems to adapt naturally to climate change, to ensure food production is not threatened and enable economic development to proceed in a sustainable manner.'

Furthermore, Convention principles outlined in Article 3 – another core element of the Convention – call for proactive measures to address the adverse impacts of climate change (as defined in Article 1). All Parties to the Convention have agreed that 'developed country Parties should take the lead in combating climate change and the adverse effects thereof' (Art. 3.1), and 'the specific needs and special circumstances of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change (...) should be given full consideration' (Art. 3.2). In addition, Article 3.3 specifically acknowledges the need for Parties to take precautionary measures to anticipate and mitigate the adverse effects of climate change, and stresses that lack of full scientific certainty should not be used as an excuse to postpone these measures.

To reach the ultimate objective of the Convention, and operationalise these Convention principles, the Parties have agreed specific commitments on adaptation under Article 4. All Parties commit to 'cooperate in preparing for adaptation to the impacts of climate change' (Art. 4.1e) and to '[f]ormulate, implement, publish and update' national 'programmes containing measures (...) to facilitate adequate adaptation to climate change' (Art. 4.1b). Under Article 4.3 of the Convention, developed country Parties have agreed to 'provide new and additional financial resources to meet the agreed full costs' of developing country Parties in complying with national communication reporting obligations, which in turn require the development of national vulnerability and adaptation assessments. Developed country Parties have also agreed to 'provide such financial resources, including the transfer of technology, needed by the developing country Parties to meet the agreed full incremental costs of implementing measures that are covered by paragraph 1 of this article' (i.e. Art. 4.1). The implementation of this commitment is to take into consideration the need for adequacy and predictability in the flow of these funds, and the importance of appropriate burden sharing among developed country Parties (Art. 4.3). All Parties have further agreed that developing countries that are particularly vulnerable to the adverse impacts of climate change shall be assisted by developed country Parties 'in meeting the costs of adaptation to those adverse impacts' (Art. 4.4).

In addition, many other Convention articles address issues relevant to adaptation, including 'Research and systematic observation' (Art. 5 in conjunction with Art. 4.1g), on 'Education, training and public awareness' (Art. 6 in conjunction with Art. 4.1i) and on 'Technology Transfer' (Art. 4.5).

Although the focus of the Kyoto Protocol is on establishing targets for GHG reductions and mechanisms for achieving it, it is also structured to assist in generating funding to address adaptation needs. Parties to the Protocol have agreed, in Article 12.8 of the Protocol, 'to ensure that a share of the proceeds from certified [CDM] project activities is used (...) to assist developing country Parties that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation'.

Against this backdrop, and with increasingly alarming projections of the potential impacts of climate change on vulnerable communities, adaptation issues have increased in prominence in recent climate negotiations. At COP 7 in Marrakech, an Adaptation Fund was established under the Kyoto Protocol, to be funded in part with the proceeds of the CDM Adaptation Levy. Two additional funds, the Special Climate Change Fund and the Least Developed Country Fund, were established under the Convention, to address a range of needs, including adaptation. At COP 8, in New Delhi, adaptation played a particularly prominent role. The resulting Delhi Ministerial Declaration on Climate Change and Sustainable Development made a number of references to the issue of adaptation, and declared, *inter alia*, that 'adaptation to the adverse effects of climate change is of high priority for all countries' and that 'adaptation requires urgent attention and action on the part of all countries' (UNFCCC 2002a). At COP 9 in Milan, further progress was made in operationalising the Special Climate Change Fund, and in developing criteria for implementation of priority adaptation activities identified by LDCs through the National Adaptation Programme of Action (NAPA) process, initiated through the Marrakech Accords.

Despite this progress, much work remains to be done to prioritise adaptation needs at the national and international levels, and ensure that adequate funding is made available to address these needs.

2.2.2 *Adaptation funding*

Little funding has been provided to address adaptation to the impacts of climate change under the Convention process. The GEF is the funding mechanism for

a number of multilateral environmental agreements, including the UNFCCC. Since 1991, the GEF has spent over \$1.5 billion on climate change project activities. The vast majority of this funding has gone to support mitigation projects (UNFCCC 2002b). Only a small fraction of GEF funding has been spent on adaptation, in the context of enabling activities, rather than project activities. The GEF's climate change focal area has four operational programmes, each of which is mitigation-related (energy efficiency, renewable energy, sustainable transport, and reduction of cost of low GHG-emitting technologies). Enabling activities, of which adaptation activities are only a subset, have represented less than 8% of all funds expended by the GEF under its climate change focal area (UNFCCC 2002b). The extremely low percentage of GEF funding directed toward adaptation activities has resulted from a lack of strong and clear guidance given by the COP to the GEF on adaptation over the years, the staged approach taken to adaptation, and the GEF's operating strategy, which includes incremental cost and global benefits criteria for project approval.

In response to continuing developing country frustrations with the difficulty of accessing GEF project funding, during the COP 6 and COP 6bis negotiations the issue of funding adaptation was taken more seriously, and three new funds were floated for adoption: the Special Climate Change Fund, Least Developed Countries Fund and Adaptation Fund. These funds were formally established at COP 7 through the Marrakech Accords (Huq 2002).

Special Climate Change Fund

The Special Climate Change Fund (SCCF) was established to assist developing countries by financing activities, programmes and measures that are complementary to those funded by the climate change focal area of the GEF, in four broad areas:

- adaptation, in accordance with paragraph 8 of decision 5/CP.7;
- transfer of technologies;
- energy, transport, industry, agriculture, forestry and waste management;
- activities to assist developing country Parties referred to under Article 4, paragraph 8(h), in diversifying their economies. (UNFCCC 2001b)

The following adaptation activities are to be supported through the SCCF and/or the Adaptation Fund:

- starting to implement adaptation activities promptly where sufficient information is available to warrant such activities, inter alia, in the areas of water resources management, land management, agriculture, health, infrastructure development, fragile ecosystems, including mountainous ecosystems, and integrated coastal zone management;
- improving the monitoring of diseases and vectors affected by climate change, and related forecasting and early-warning systems, and in this context improving disease control and prevention;
- supporting capacity building for preventative measures, planning, preparedness and management of disasters relating to climate change, including contingency planning, in particular, for droughts and floods in areas prone to extreme weather events;
- strengthening existing and, where needed, establishing national and regional centres and information networks for rapid response to extreme weather events, utilizing information technology as much as possible. (UNFCCC 2001b)

The COP's guidance to the GEF, which provides that the above activities will be supported through either the SCCF or the Adaptation Fund ('and/or'), itself raises issues regarding the complementarity of these two funds, and the longevity of the SCCF (Mace 2003).

At SB-18 the Parties made slow progress toward the operationalisation of the SCCF, through the prioritisation of the four broad categories of activities for funding through the SCCF. The Parties agreed that 'adaptation activities to address the adverse impacts of climate change' were a 'top priority' for funding, and that technology transfer and its associated capacity-building activities were 'also essential' (UNFCCC 2003c).⁶ At COP 9, the Parties made little further progress in prioritising the activities previously agreed for funding through the SCCF.

As a result of these negotiations, it remains unclear how much funding will be available for adaptation, or for any of the other categories of activities to be addressed by the SCCF.

⁶ The language 'adaptation activities to address adverse impacts of climate change' was used deliberately, to separate these activities from those that address the adverse impacts of response measures.

Least Developed Countries Fund

The Least Developed Country Fund was established through the Marrakech Accords to support an LDC Work Programme, which includes, among other elements, the preparation in and by LDCs of National Adaptation Programmes of Action (NAPAs), a bottom-up, country-driven process, intended to result in a list of each country's most urgent and immediate priority adaptation needs (UNFCCC 2001b).

Despite the affirmative commitment undertaken by developed country Parties to assist particularly vulnerable countries in meeting the costs of adaptation, under Article 4.4, and the commitment also made by developed country Parties to provide funding through the GEF for the implementation of developing country commitments under Article 4.1, the LDC Fund is not funded by mandatory contributions from Convention Parties. Only a subset of countries has committed funding, and it is clear that these funds will be insufficient to implement the adaptation activities identified through the NAPA process.

COP 9 asked the GEF to support the implementation of NAPAs upon their completion, and to take a number of elements into account when developing operational guidelines for funding NAPA implementation, including: ensuring a country-driven approach, consistency with national priorities, cost-effectiveness and complementarity with other funding sources, equitable access by LDC Parties to funding, and criteria for supporting activities on an agreed full-cost basis, taking account of the level of funds available, guidelines for expedited support, urgency and immediacy of adapting to the adverse effects of climate change and prioritization of activities.

The ceding of authority by the group of developing countries to the GEF, to develop operational guidelines for the funding of NAPAs, is in many ways a step backwards, and illustrates the negotiating power of developed country Parties, as the LDC Fund and work programme was born out of frustration that LDCs experienced in accessing funding under the GEF.

Adaptation Fund

The third fund created at COP 7 was the Adaptation Fund established under the Kyoto Protocol to support 'concrete adaptation projects and programmes in developing country Parties that are Parties to the Protocol' (UNFCCC 2001b). This fund is to be financed from an 'adaptation levy' to be placed on all CDM projects. In addition Annex I Parties that 'intend to

ratify the Kyoto Protocol are invited to provide funding, which will be additional to the share of proceeds on clean development mechanism project activities' (UNFCCC 2001b). Thus it is unlikely that this fund will receive large-scale funding from this source before 2008, and the size of the fund will, of course, be largely dependent on the size of the CDM market.

In reviewing the funds created under the Marrakech Accords, an important point is that while a number of Annex II Parties (EU members, Canada, Iceland, New Zealand, Norway, Switzerland), declared in July 2001 that they would collectively contribute \$410 million (€ 450 million) per year for climate change-related activities by 2005, with this level to be reviewed in 2008, it is not clear as yet how these contributions will be used to support the activities of any particular fund. The funding to be counted toward the pledged total can include contributions to GEF climate change-related activities; bilateral and multilateral funding additional to current levels; funding for the SCCF, the LDC Fund, the Adaptation Fund; and funding derived from the share of proceeds of the CDM following entry into force of the Kyoto Protocol (UNFCCC 2001c).

Thus, while this pledge is a useful starting point, it is clear that none of these funds is mandatory, none is necessarily to address the adaptation needs it targets, and none is linked to a predictable and adequate stream of adaptation funding. Moreover, while the LDC Fund and the SCCF are created under the Convention, the Adaptation Fund has been created under the Kyoto Protocol. Hence different groups of countries may ultimately be contributing to each fund. What this means in practical terms, is that adaptation funding does not reflect an equitable burden sharing arrangement among developed country Parties to the Convention. There is at present no clear link between GHG emissions, and adaptation funding, particularly for countries such as the US that have rejected the Kyoto Protocol and that have opted not to contribute to the LDC and SCCF.

Challenges for the development of an adequate and equitable framework on adaptation include the interplay between the various sources of adaptation funding (GEF, LDC Fund, SCCF, Adaptation Fund); appropriate burden sharing of adaptation costs among developed country Parties; the prioritisation of adaptation activities among and within developing countries; the sufficiency of funding for the projects identified in NAPAs and National Communications; the further elaboration of specific activities to be addressed by

the SCCF; and the development of clear guidance to the GEF in connection with adaptation activities.

2.2.3 Insurance mechanisms

Funding and insurance for adaptation needs to be linked to responsibility for causing climate change by emitting GHGs. The UNFCCC's 'polluter pays' principle needs to be operationalised for appropriate burden sharing. Adequate and predictable revenue streams are essential for adaptation funding (with new and additional funds). There are various ways to accomplish this.

In 1991 AOSIS proposed the creation of an International Insurance Pool, to compensate victims of global sea level rise. The pool was to be funded with contributions based on Parties' contributions to GHG emissions as well as GDP. This proposal has elements in common with a number of other transboundary pollution regimes that use mandatory insurance mechanisms to ensure that victims receive some degree of compensation from private sector interests that benefit from activities that are inherently risky, and then backstop this compensation with contributions from national governments acting jointly. The oil spill liability regime, in particular, may prove a useful model for further exploration, in considering ways to both create an income stream for adaptation needs and facilitate the internalisation of the true costs of carbon.

Since the UNFCCC's workshops on risk assessment and insurance in May 2003, a number of insurance-related actions have been proposed in negotiations at SB-18 and SB-19 related to Article 4.8. Among other elements, the G-77 and China bloc has proposed draft conclusions for the SBI's consideration (UNFCCC 2003d).

Tiered national and regional insurance schemes, that utilize traditional insurance mechanisms, collective loss sharing elements, and global reinsurance mechanisms, may be useful in addressing the impacts of climate change. These and other innovative risk transfer mechanisms can assist developing countries in managing risk from extreme weather events, aiding recovery efforts and contributing to sustainable development. At the same time, these mechanisms assist in sharing the burden of responsibility for damages resulting from climate change among the broader global community.

2.3 National circumstances, needs and capabilities

Fairness in dealing with climate change requires that differences between countries are taken into account. The Convention codifies this in the first principle, tying together equity, responsibility and capability:

The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of *equity* and in accordance with their *common but differentiated responsibilities* and *respective capabilities*. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof. (Article 3.1; emphasis added)

Equity is related to common but differentiated responsibilities, but also to capabilities which will vary according to national circumstances and needs.

2.3.1 Annex I / non-Annex I differentiation

The first consequence of 'common but differentiated responsibilities and respective capabilities' is that developed countries must take the lead. For the developed countries, there has already been differentiation of emission limitation obligations. In the Kyoto Protocol, Annex B Parties differentiated their targets relative to 1990 levels, ranging from a 8% reduction to a 10% increase. In aggregate, if all Parties ratified and met their targets, emissions would be reduced by 5.2% below 1990 levels.⁷ However, commitments contained in the Kyoto Protocol are only a first step. Any definition of adequacy consistent with Article 2 UNFCCC will require increased mitigation efforts from virtually all countries, i.e. deep emissions cuts in industrialized countries and the avoidance of emissions (compared to business-as-usual trends) in developing countries, and ultimately emissions reductions for some. Therefore, emission limitation commitments will form a central element of any future architecture of the climate regime.

Equity, responsibility and capability will be more important than ever in shaping a future agreement. What is required in thinking beyond 2012 is further and more systematic differentiation. There are two major purposes for such differentiation. One purpose is to enable a more transparent and useful interpreta-

⁷ This percentage ignores the concessions made on forestry at COP 6bis and COP 7 to enable the Marrakech Accords. Den Elzen and De Moor (2001) note that this reduced the effective target to 2.7%.

tion of the phrase ‘common but differentiated responsibilities and respective capabilities’ by characterizing responsibility and capability in terms of quantified parameters such as per capita emissions, GDP per capita, or other pertinent indicators of national circumstances. Doing this will allow the creation of an objective framework for relating the type of commitment expected of a country to its national circumstances, as is done in section 3.1 below. The second purpose is political, seeking to identify potential members of a progressive alliance to promote future climate action. National interests of different countries (shaped by, for example, climate and heating/cooling needs or resource endowments such as fossil fuels or forests) would shape such political alliances. This second issue is taken up in section 3.2.

The first level of differentiation, that between Annex I and non-Annex I remains valid. It is difficult to imagine any action by developing countries if industrialised countries, and particularly the US as the largest polluter, do not reduce emissions. Consequently, it can be assumed that quantified mitigation targets for non-Annex I countries only become binding if the major Annex I Parties have binding quantified emission reduction obligation (QUEROs). Beyond this first level of differentiation, however, an equally important level of differentiation among non-Annex I countries must also be defined in light of the wide diversity of national circumstances found within the group of non-Annex I countries.

2.3.2 Differentiation among non-Annex I countries

The differentiation under the Berlin Mandate was hardly systematic. While the Triptych approach applied internally within the EU was developed precisely in recognition of the need for further differentiation, this was not applied globally. The challenge in defining an adequate and equitable global climate agreement for the future is to find ‘a logical, top-down and long-term resolution in the context of a political process that is inherently illogical, bottom-up and mostly concerned with the current or next round of commitments’ (Grubb et al. 1999: 273). Differentiation among countries is a critical element in this process.⁸ In a negotiating regime characterized by dramatic disparities in negotiating resources and geopolitical power, it is vitally important that differentiation be deliberated on

the basis of an open, transparent, analytically-based framework rather than relying totally on a non-transparent bargaining process that is highly political and oftentimes coercive. It is with the objective of working toward such a framework that we outline a transparent differentiation proposal in this section.

We start with the acknowledgement in the UNFCCC (Article 3.1) that Parties contributions should reflect their *responsibility* and *capability*, and to these we add, for clarity, another indicator – *potential*. We propose that these three characteristics be integrated into a differentiation framework in the follow way:

- Responsibility – as a reflection of a Party’s contribution to the climate problem through historic and ongoing GHG emissions.
- Capability – as a reflection of a Party’s financial and socio-economic wherewithal to help overcome the climate problem.
- Potential – as a reflection of the mitigative opportunities within a Party’s economy to reduce GHG emissions or to pre-empt the growth of GHG emissions through cleaner development.

For each of these characteristics, we propose that specific, concrete indicators be used to quantitatively capture each country’s national situation.

Responsibility may be the most straightforward characteristic to capture quantitatively. It has been defined in the Brazilian proposal as a country’s contribution to temperature increase (UNFCCC 1997; La Rovere et al. 2002). In this analysis, we use the approximation of cumulative emissions of fossil CO₂ over the period 1990 to 2000. The relatively recent period avoids ‘punishing’ countries for historical emissions, when the consequences were less widely known. At least since the IPCC’s First Assessment Report in 1990, the implications can be said to be well-known internationally. This indicator is arguably quite generous to countries that started to industrialize early and whose emissions up to 1990 are significant.

Capability as a criterion recognises the fact that a country’s capability to reduce emissions might be quite different from its level of responsibility. A country may have relatively high responsibility for contributing to climate change, but nonetheless be too poor to devote

⁸ In this chapter, we consider differentiation primarily in relation to mitigation. The overall package, however, makes clear that some groups of countries rightly focus on adaptation.

resources toward mitigation and/or it might not have access to the needed technologies. Emissions do not have to be linked to human development, but under given socio-economic and technological conditions, a certain level of emissions will be necessary to guarantee a decent life for poor people (Pan 2002). We consider two indicators of capability, the HDI and GDP per capita. The HDI measures the average achievements in a country in three basic dimensions of human development, life expectancy, literacy and income.⁹

Potential can be related to three indicators – emissions per capita, emissions intensity, and emissions growth rate. A high value for CO₂/GDP would suggest high potential to mitigate. The more efficient an economy already is (lower CO₂ emissions per unit GDP), the less potential there is (at a given cost) to mitigate further through efficiency. However, the level of emissions per capita needs to be taken into account as well. High per capita emissions suggest unsustainable consumption patterns, which implies considerable potential to mitigate without endangering a basic level of development, e.g. by life style changes. Finally, the growth rate of absolute emissions gives an idea of whether the rate of increase is still high or has already been curbed.

Arguably, mitigative potential should also reflect resource endowments and climate – in particular, energy resource endowments (whether a country has lots of carbon-intensive resources like coal or renewable resources like hydro). However, determining the mitigative potential for each country more accurately requires an analytical effort that we cannot undertake here, but which might be usefully explored further. We use the simpler metrics here.

Quantitatively assessing the indicators for responsibility, capability and potential for all countries clearly captures the dramatic differences among them (see Table 1), and suggests the different levels of commitments to which an equitable regime should oblige them. The current climate regime, which lumps all developing countries together as non-Annex I, obscures the huge variety of countries included in this group. While meaningful progress toward a global climate solution will require a framework for equitably defining differentiated roles for non-Annex I countries,

this differentiation does not imply that non-Annex I countries should no longer negotiate together as ‘G77 and China’, which bloc has served as an important means of consolidating and wielding some degree of negotiating power.

Non-Annex I countries cover a very wide range of values for each of the three criteria, always including very low values and sometimes some of the higher values as well, as shown in Table 1. Responsibility to mitigate is radically lower on average for non-Annex I countries than for Annex I countries. The non-Annex I group includes all the countries with less than 0.5 t CO₂/person emitted between 1990 and 2000,¹⁰ but also the only country (Qatar) with greater than 500 t CO₂/person. For capability as reflected by GDP per capita, non-Annex I includes the least wealthy country with \$ 450 per person in 2000 (PPP US\$), but also two countries (Singapore and the United Arab Emirates) whose per capita incomes exceed the Annex I average of \$22,000. Potential to mitigate can be very low, at 17 t CO₂/million \$ GDP, but ranges all the way to the highest value across the row of 2 325 t CO₂/million \$ GDP (again, Qatar).

Given this diversity of national circumstances, there is little reason to think that all non-Annex I countries should respond in the same manner to the climate challenge (see Winkler et al. 2002a). While recognising that the G77 remains an important vehicle for solidarity, developing countries will need to identify different forms of climate action for different members if the climate challenge is to be successfully addressed.

The process of individual countries announcing voluntary commitments has been divisive in the past. However, two alternative approaches to single country action are possible. One way would be for the G77 as a group to put forward a proposal on differentiation, possibly phased over time. More promising might be an endorsement by the G77 for action by a smaller group (e.g. NICs, perhaps also RIDCs).

Groupings of countries can be defined both politically and analytically. Some political groupings are well-established in the climate process. As explained in section 2.1 the differentiation between Annex I and

9 A long and healthy life, as measured by life expectancy at birth; knowledge, as measured by the adult literacy rate (with two thirds weight) and the combined primary, secondary and tertiary gross enrolment ratio (with one third weight); a decent standard of living, as measured by GDP per capita (PPP US\$) (UNDP 2003).

10 Countries with cumulative emissions from 1990 to 2000 of 0.5 tCO₂/person or less include Cambodia, Chad, Ethiopia, Mali and Uganda.

Table 1: Criteria for differentiating countries Source: WRI (2003); UNCTAD (2002); UNDP (2002, 2003)

	Annex II	Annex I, but not Annex II	non-Annex 1 (for information only)	NICs	RIDCs	Other DCs	LDCs
Analytical basis	Defined in the Convention, includes the most highly industrialised countries	Defined in the Convention, includes less highly industrialised countries	Defined in the Convention	Highest among NAI (without LDC) in terms of an index of potential, responsibility and capability	Less high on the index, but GDP growth over the last decade > 2% and high income relatively to other NAI	NAI (without LDC and NIC) with GDP growth < 2% and/or low income relatively to other NAI	Defined by UN
Potential to mitigate CO₂/GDP, 2000 (in t CO ₂ / Mill. US \$)							
– Range	210 to 706	385 to 1,768	17 to 2,325	481–2,325	109 to 867	86 to 1,833	17 to 1,015
– Group average	476 Medium	1,090 Very high	537 Medium	908 High	567 Medium	424 Medium	134 Low
GHG/capita, 2000 (in t CO ₂ equiv.)							
– Range	7.1 to 24.9	4.4 to 14.0	0.2 to 67.9	4.5 to 67.9	1.3 to 19.8	1.0 to 11.5	0.2 to 5.7
– Group average	15.9 Very high	10.0 High	3.3 Medium	12.0 High	4.3 Medium	2.1 Low	1.5 Low
CO₂ emissions growth, 1991–2000 (in %)							
– Range	–3.3 to +4.1	–8.4 to +4.6	–11.6 to 21.8	–7.6 to 17.5	–6.9 to +12.0	–11.6 to +11.2	–10.5 to +21.8
– Group average	1.2 Narrow range	–3.6 Medium range	3.4 Wide range	2.7 Wide range	3.6 Wide range	3.8 Wide range	4.5 Wide range
Responsibility to mitigate Cumulative CO₂/capita, 1990–2000 (in t CO ₂)							
– Range	58.4 to 240.2	29.1 to 151.2	0.1 to 521.8	26.7 to 521.8	8.4 to 64.6	2.2 to 80.0	0.1 to 12.3
– Group average	134.9 Very high	95.4 High	19.2 Low	92.3 High	27.4 Low	10.1 Low	1.4 Very low

	Annex II	Annex I, but not Annex II	non Annex 1 (for information only)	NICs	RIDCs	Other DCs	LDCs
Capability to mitigate GDP/capita, 2000 (in US \$-PPP)							
– Range	16,530 to 53,410	3,980 to 16,530	450 to 23,700	1,700 to 23,700	3,740 to 20,330	860 to 8,900	450–5,650
– Group Average	27,526 Very high	7,011 Medium	3,686 Low	10,701 Medium	5,025 Medium	2,602 Low	1,205 Very low
HDI, 2000							
– Range	0.88 to 0.94	0.75 to 0.88	0.28 to 0.90	0.73 to 0.90	0.57 to 0.88	0.43 to 0.81	0.28–0.74
– Group average	0.93 Very high	0.81 High	0.63 Medium	0.81 High	0.77 Medium	0.65 Medium	0.46 Low
Total GHG emissions, 2000 (in Mt CO ₂ equiv.)							
– Sum:	13,622	3,829	15,630	1,714	8,695	4,095	945
– Top five:	USA: 6,932 Japan: 1,334 Germany: 972 Canada: 714 U.K.: 662 [EU (15): 3,978]	Russia: 1,905 Ukraine: 522 Poland: 375 Czech Rep.: 143 Romania: 135	China: 4,967 India: 1,854 Brazil: 841 Korea (South): 526 Mexico: 511	Korea (South): 526 Saudi Arabia: 330 Uzbekistan: 181 Kazakhstan: 159 Unit. Arab. Em.: 108	China: 4,967 Brazil: 841 Mexico: 511 Iran: 439 South Africa: 413	India: 1,854 Indonesia: 495 Pakistan: 285 Venezuela: 241 Egypt: 178	Bangladesh: 122 Sudan: 100 Myanmar: 82 Cambodia: 69 Ethiopia: 63

NOTES

HDI data for Bosnia & Herzegovina are as of 2001.

No HDI data available for Afghanistan, Cook Islands, Iraq, Kiribati, Korea (North), Liberia, Nauru, Niue, Palau, Serbia & Montenegro, Tonga.
No emissions/GDP data available in WRI (203) for Somalia and Tuvalu (both LDC) and Liechtenstein and Monaco (both Annex II).

non-Annex I remains valid as the first level of differentiation. On the other end of the spectrum the group of LDCs are also well defined by the UN but also the Convention, and have recently acted in a concerted fashion in the climate negotiations, e.g. in the LDC fund for adaptation.

Besides these two levels of differentiation, the analysis here seeks to provide a more analytical base for groupings of (developing) countries (see Box 1).¹¹ Countries

were categorized according to the three criteria mentioned above, thereby identifying some new groups, such as NICs and RIDCs that are seen particularly important in taking the next round of climate negotiations forward. Altogether, non-Annex I countries were differentiated in four groups each including countries with similar national circumstances (see Annex 1 for groups' composition). This grouping builds the basis for the assigning of mitigation and financial transfer commitments in section 3.1.

Box 1: Differentiating non-Annex I countries: Analytical basis of groupings

The process for identifying the groups of NICs and RIDCs started with all non-Annex I countries, as well as Non-Parties to the UNFCCC. Using the CAIT (climate analysis indicator tool) (WRI 2003), we created an index combining responsibility, potential and capability – equally weighting cumulative emissions per capita, the HDI and an indicator of potential (derived from CO₂/GDP and GHG/capita). LDCs, which by definition have low potential, low capability and low responsibility, formed a distinct analytical group. The remaining non-LDC non-Annex I countries were ranked by this index.

NICs were identified as those countries with an index value one standard deviation above the mean, i.e. those with the highest aggregate score. Focussing on those non-Annex I countries with a medium index value (mean plus/minus one standard deviation) the next level of differentiation identified RIDCs. Those can reasonably be defined as having relatively rapid industrial growth in the last decade and relatively high income. Without the latter criteria, some countries with high growth off a very low base would have been included. RIDCs were therefore selected from the remaining developing countries, as those with higher per capita GDP-PPP than non-Annex I average and with higher than 2 percent annual growth in 1991–2000.¹²

Finally, the remaining 39 developing countries that are neither NIC/RIDC nor LDC are grouped as 'other developing countries'. They are at a very early stage of industrialisation but are not as poor as those countries defined as 'less developed' – just 'regular' developing countries. All groups' compositions are listed in Annex 1.

This process merely identified the groups, not the type of commitment. The types of commitments indicated for each group were derived by applying criteria of responsibility, capability and potential using the decision rules in Box 2 (see section 3.1).

¹¹ The discussion on different political interests, however, is dealt with in section 3.2 on political leadership.

¹² Due to a lack of GDP data in the early 1990s the period 1995–2000 was used for Bosnia & Herzegovina.

3 Exploring options

A policy package that offers guidance on the content of a future climate agreement (commitments for mitigation and adaptation activities as well as required financial transfers) and the process of achieving it should contain the following elements.

3.1 Differentiation of commitments and responsibilities

3.1.1 Commitments on mitigation

In the long-term, any definition of adequacy consistent with Article 2 UNFCCC will require increased mitigation efforts from almost all countries. Therefore, an expansion of emission limitation commitments will form a central element of any future architecture of the climate regime. This expansion has two elements: deepening of quantitative commitments for those countries in Annex B and the adoption of commitments for those countries outside of the limitation regime (see section 2.1). The question is therefore which groups of countries have to take on what type of (mitigation) commitment?

A crucial observation underlying our answer to this question is that mitigation efforts will be required in all countries that have mitigation opportunities, even in those with little moral obligation or practical ability to dedicate their own scarce resources to mitigation. The only way that mitigation potential in these countries can be taken advantage of is if other countries with responsibility and capability are obligated to provide the financial and technical resources to make substantive mitigation feasible.

Thus, for the purpose of determining which countries have to take on what types of commitments, we draw on a set of decision rules based on the three factors: potential, responsibility and capability (see Box 2). We then apply these decision rules to countries, to define an appropriate type of commitment. The term 'commitment' refers to mitigation obligations (quantitative and qualitative) as well as to obligations to provide financial and technological resources.

Two basic principles underlie the decision rules:

- Potential to mitigate determines how much mitigation activity occurs in given country. (This mitigation activity refers to either absolute emissions reductions, or avoidance of future emissions through cleaner and more efficient development.)

- Responsibility and capability together determine the scale of financial and technological resources a country is required to devote to mitigation activity. (Accordingly, countries with high responsibility and/or capability will undertake mitigation activity domestically to the extent that they also have potential. Beyond that, they will provide support for mitigation activity in countries that have potential but comparatively little responsibility and/or capability.)

The first principle seeks to ensure that the climate regime is economically efficient, in the sense of directing mitigation effort toward those groups of countries in which there is the most potential for mitigation. The second principle seeks to ensure fairness, in that it requires that the mitigation activity is the task of those countries on the basis of their responsibility causing climate change and their capability to provide financial and technological resources to address that threat.

The decision rules derived from these principles are shown in Box 2 below, and can be explained as follows:

The 'potential to mitigate' (high or medium) determines the amount of reductions to be carried out domestically. (Low potential implies that domestic reductions are not a priority.) A country with a high potential would be obliged to exploit this potential, i.e. to accept quantitative commitments to reduce domestic emissions. However, this commitment is in the context of a climate regime where financial and technological resources for mitigation are assured, so the level of mitigation efforts as determined by this rule does not imply that countries would necessarily have to pay for their mitigation efforts themselves.

The amount a country is obliged to pay toward mitigation is determined by 'responsibility to mitigate' in combination with 'capability to mitigate'. Countries having high capability and responsibility would be obliged to pay for all their emission reductions, and also to provide financial and technological resources for mitigation in other countries with medium/low capability and responsibility.

Higher levels of responsibility suggest not only a higher level of resources devoted to mitigation, but also a binding legal form of their mitigation commitment. Commitments for those with medium responsibility would be binding only if all 'high responsibility' countries have taken on mitigation and funding com-

Box 2: Decision rules for determining commitments

Potential to mitigate

High potential	→	High domestic reductions
Medium potential	→	Limitation of domestic emissions

Responsibility to mitigate

High responsibility	→	Binding absolute reduction target
Medium responsibility	→	Quantitative commitments only binding if all 'high responsibility' countries take on commitments and conditional on transfer of adequate financial and technological resources
Low responsibility	→	Optional/voluntary mitigation commitments

Capability to mitigate

High capability	→	Financial transfers for mitigation activities to 'low/medium capability' countries
Medium capability	→	Co-sharing: mitigation partly funded by 'high capability' countries
Low capability	→	All mitigation activities funded by 'high capability' countries

mitments, while low responsibility suggests mitigation action of a voluntary nature.

These decision rules can now be applied to the country groups identified in section 2.3. Since indicators for the given countries within a group span a considerable range of values (see Table 1), there should be a corresponding gradation of commitments. For clarity, we will talk here in terms of entire groups.

Applying the decision rules result in (strict) reduction commitments for Annex I countries, but also imply quantifiable mitigation obligations for some non-Annex I countries enabled by financial and technological transfers from the North (see Table 2; for more details on numbers see Table 1). It is worth emphasizing that Annex I countries would still take the lead in combating climate change. However, at least some non-Annex I countries – those that are higher-emitting and wealthier – would have to contribute substantially more to global mitigation efforts in the near future than they have in the past.

A closer look at the resulting commitment reveals the following. Both Annex I groups retain Kyoto-style commitments that means quantified (absolute) emissions reduction obligations with targets for Annex II countries being more demanding than Kyoto levels. The latter would also be committed to financial and technological transfers to non-Annex I countries, particularly to those with low to medium capability to mitigate.

But not only Annex I countries would have to take on quantitative mitigation commitments. Countries belonging to the group of NICs and RIDCs would have to do so as well – although subject to some conditionality. We defined agreed triggers that lead to the start of developing country quantitative emission targets. Agreed triggers differ from 'graduation' triggers in that they include conditions for both developing and industrialised countries.

Applying the decision rules above results in absolute limitation or reduction targets for NICs due to their high responsibility and potential to mitigate. However, these commitments are subject to the conditionality that all major Annex I countries (including the US) take on quantified emission reduction commitments and fulfil their commitments to provide financial and technological resources. While NICs will have access to financial and technological resources (from Annex II countries) for part of their mitigation activities, this share is expected to be smaller than for RIDCs, in accordance with their relative capacities. Also the latter would be obliged to take on absolute limitation targets. However, the conditionality concerning Annex I participation in the regime is also valid for RIDCs, as well as the availability of full funding of incremental costs for mitigation activities by Annex II countries. Regardless of whether the terms of conditionality for quantified commitments are fulfilled, NICs as well as RIDCs would engage in qualitative mitigation commitments (see Table 2). This type of commitments will also be obligatory for the group of 'other developing

Annex II	→	binding (strict) absolute reduction targets, domestic reduction
	→	high direct payments to non-Annex I
Annex I, but not Annex II	→	binding absolute reduction targets, domestic reduction
	→	low / no payments to non-Annex I

countries', but quantifiable mitigation commitments for these countries and the LDC group would not be justifiable – and not in line with the decision rules (until their status changes).

The approach chosen for differentiation among countries in order to assign different kinds of commitments is not static. As national circumstances in countries evolve over time the composition of the groups will change. As a country exceeds (or falls below) a certain threshold in all of the three criteria (potential, responsibility, capability to mitigate), it will move from one group to another group and, as a consequence, will have to take on other types of commitments. Countries graduate when their indicators become more representative of the next higher group. Therefore, after each commitment period, the composition of the groups may need to be modified.

3.1.2 Commitments on adaptation

The issue of adaptation to climate change has risen rapidly up the policy agenda, both internationally and nationally. It is clear that much remains to be done to gain a better understanding of the multitude and complexity of issues involved, through research and analysis. It is also clear that far more ambitious efforts must be taken to chart a way forward in addressing these issues both inside and outside the international negotiating process. One observation cannot be refuted: little further progress in the international negotiations can be expected without taking into account the concerns of most of the developing countries, which relate in large part to funding and mechanisms for addressing adaptation to the impacts of climate change.

Imperative for adaptation

It is increasingly evident that the consequences of climate change resulting from past GHG emissions will be unavoidable in the short-to-medium term. The

NICs	→	absolute limitation or reduction targets, domestic reduction*
	→	qualitative commitments (see Table 2)
	→	some financial transfers from Annex II
RIDCs	→	absolute limitation targets (conditional to funding)*
	→	qualitative commitments (see Table 2)
	→	high direct payments from Annex II
Other DCs	→	no quantified commitments
	→	qualitative commitments (see Table 2)
	→	direct payments from Annex II
LDCs	→	no quantified commitments
	→	qualitative commitments (see Table 2)
	→	direct payments from Annex II

* Targets only could become binding if all major Annex I countries have binding QUERO's.

Table 2: Differentiated commitments for groups of countries Source: UNDP (2003:2002); WRI (2003)

	Annex II	Annex I, but not Annex II	NICs	RIDCs	Other DCs	LDCs
Potential to mitigate CO ₂ /GDP, 2000 GHG/capita, 2000 CO ₂ emissions growth, 1991-2000	Medium Very high Narrow range	Very high High Wide range	High High Wide range	Medium Medium Wide range	Medium Low Wide range	Low Low Wide range
Responsibility to mitigate Cumulative CO ₂ /capita, 1990-2000	Very high	High	High	Low	Low	Very low
Capability to mitigate GDP/capita, 2000 HDI, 2000	Very high Very high	Medium High	Medium High	Medium Medium	Low Medium	Very low Low
Mitigation commitments Type of quantitative commitment	Binding (strict) absolute reduction targets, domestic reduction	Binding absolute reduction targets, domestic reduction	Absolute limitation or reduction targets, domestic mitigation*	Absolute limitation targets, if funding and technology provided from Annex I*	No targets	No targets
Qualitative action			SD-PAMs (obligatory), Sector CDM, Non-binding RE & EE targets	SD-PAMs (obligatory, co-funded), Sector CDM, Non-binding RE & EE targets	SD-PAMs (obligatory, co-funded), Sector CDM, Non-binding RE & EE targets	SD-PAMs (optional, funded), Sector CDM, Non-binding RE & EE targets
Commitments to provide financial and technological resources to support mitigation activities	High direct payments (out) to non-Annex I.	Low / no payments.	NIC co-funds mitigation, but some transfers from Annex II.	High direct payments from Annex II.	Direct payments from Annex II.	Direct payments from Annex II.

* Targets only could become binding if all major Annex I countries have binding QUEROs.

SD-PAMs: Sustainable development policies and measures (Winkler et al. 2002b). For sector CDM and other approaches, see Baumert et al. (2002).

spectre of a changing climate system puts millions of lives and livelihoods at risk, and is expected to result in an array of unrecoverable losses – to ecosystems, to biodiversity, to cultural heritage, to natural resources, to land mass and even to sovereignty, as is possible in the case of some small island states. An enormous amount of associated human suffering can be expected. Adaptation to the predictable consequences of climate change, and the development of means to reduce vulnerability to its unpredictable impacts, will be necessary. The identification of appropriate means to support and facilitate adaptation is already an urgent priority, and strong adaptation actions must form a significant part of the post-Kyoto negotiations. The development of an agreement on burden sharing for the costs of adaptation is essential, together with the development of an equitable and just means to address adaptation needs in the most vulnerable nations. At the same time, seriously enhanced mitigation efforts are needed to slow the rate of GHG emissions, to avoid still further unrecoverable losses and suffering.

Equity

Many of the most severe adverse impacts of climate change will fall on the poorest countries and communities. These countries and communities are likely to have the least adaptive capacity, the least bargaining power, and the least likelihood of having their interests adequately reflected in the international negotiations on climate change. The ‘polluter pays’ principle enshrined in the UNFCCC makes it incumbent on Annex I countries to build the adaptive capacity of the poorer and most vulnerable countries. The notions of equity and justice must be recognised and applied in future negotiations, with the implications of these key principles reflected in both the decision-making process on adaptation, and in the substance of the decisions taken, with respect to impacts, vulnerabilities and funding for adaptation measures.

Adaptation, mitigation and sustainable development

The most direct way to avoid the adverse impacts of climate change, and the consequent need to adapt to these impacts, is to reduce emissions of GHGs. Nevertheless, both mitigation and adaptation will be required if countries and communities are to succeed in coping both the causes and effects of the climate change challenge. Within developing countries, actions for mitigation and adaptation to climate change are both best addressed within an overall framework of ‘sustainable development’. While many adaptation measures within developing countries will benefit from integra-

tion (or ‘mainstreaming’) into development planning frameworks and strategies, this integration will entail additional cost, and under the UNFCCC it must be recognized that the costs of adaptation to the impacts of climate change are intended to be met through ‘new and additional’ funding, rather than merely through existing overseas development aid budgets.

Research and technology

There is much that needs to be learned about adaptation to climate change including ‘what to do’ and ‘how to fund it?’ The identification and role of appropriate technologies, including ‘hard’ and ‘soft’ technologies, are important in this respect. Enhancement of the research and analytical capacity of developing countries, with special emphasis on the most vulnerable countries, is an absolute priority. Appropriate and capable institutions must be in place to assist vulnerable countries in adapting to climate change, through targeted research and learning. Capacity is needed to support in-country analysis of adaptation needs, and the development of necessary adaptation strategies which countries can themselves undertake to address their future needs.

Capacity building

There is an enormous need for capacity building in developing countries if an equitable framework on adaptation is to be developed. Capacity building is needed at different levels and in many different areas:

- *Negotiating capacity:* The strengthening of the collective negotiating abilities of the members of the G77 and China group (and sub-groups within it), will make the international negotiations a more equitable process, and the results of these negotiations more reflective of true developing country needs and priorities. This capacity-building has three elements: (i) building negotiating skills; (ii) building in-country ability to develop negotiating positions based on country priorities; (iii) creating opportunities for interaction between developing country negotiators between international negotiating sessions.
- *Strengthening the most vulnerable communities:* Most countries have done a preliminary vulnerability to climate change assessment for their countries, to identify their most vulnerable sectors and regions. These assessments require refinement, to identify countries’ most vulnerable communities, so that strategies may be developed, based on the specific socio-economic needs of these commu-

nities, to help them better cope with the future impacts of climate change.

- *Sector-specific capacity building*: Stakeholders involved in sectors that have been identified as vulnerable to climate change (e.g. water resource management, coastal zone management, agriculture) require sector-specific capacity building on viable adaptation strategies and options.
- *National policy level capacities*: Many current policies may enhance vulnerability to climate change, rather than reduce vulnerability (e.g. policies that encourage or fail to deter the building houses on floodplains). Capacity building is needed to sensitise policy-makers to the impacts their decision making may have on adaptive capacity.
- *Scientific and research capacity*: In order to build adaptive capacity to deal with climate change, three main domains of scientific and technical knowledge and capacity must be enhanced in vulnerable countries: (i) the ability to construct credible scenarios of future changes, such as climate change, that would result in the exposure of people and the environment to additional stresses; (ii) the ability to assess vulnerabilities that would arise from these exposures, and to assess adaptation strategies to limit harm or enable recovery; and (iii) the ability to effectively communicate information about exposures, vulnerabilities and adaptation strategies to technically trained managers, and the corresponding ability of managers to understand and use relevant information.
- *Public awareness*: Greater efforts are needed to increase public awareness of both the potential impacts of climate change and possible adaptation options and strategies, to enable decision making at the individual and community levels.

Funding adaptation

Funding for adaptation must be linked to responsibility for the impacts of climate change. The UNFCCC's 'polluter pays' principle needs to be operationalised for appropriate burden sharing, and existing liability and compensation schemes, e.g. the oil spill and nuclear regimes, may provide useful guidance. Adequate and predictable revenue streams are essential for adaptation funding, and new and additional sources of funding must be identified.

The current rules for funding adaptation through the GEF, which include incremental costs and global benefits criteria for project approval, must be modified to enable adaptation projects to be undertaken that result largely or exclusively in local benefits. For example, the relocation of communities away from

coastal areas may be a necessary adaptation measure, but one that does not produce global benefits and that requires outside funding assistance. The allocation of separate and discrete funds by the GEF for adaptation to the impacts of climate change may facilitate the modification of the GEF's funding strategy.

The capacity of countries to access GEF funding for adaptation, to conceive and undertake GEF projects, and to mainstream adaptation into national development all need to be enhanced, and supported through new and additional funding. Activities for external funding need to be practised on a rational basis (e.g. through prioritising actions with adaptation as well as mitigation benefits, and prioritising the needs of the most vulnerable communities). Immediate focus should be given to finalising the negotiations on the SCCF, reemphasizing that adaptation to the impacts of climate change is of top priority.

Insurance

Innovative insurance schemes should be explored and piloted for the management of climate risks at the local, national, regional and international levels. A variety of alternative insurance schemes and risk transfer mechanisms hold great potential for attracting interest from the private capital markets, for instruments that can be used to address risks related to climate change impacts. Public-private partnerships, between the governments of nations vulnerable to the impacts of climate change and the insurance industry, present useful opportunities to leverage both governmental and private sector expertise to address climate-related risks. Mutual benefits for governments and the private sector alike can be realised, for example, in the related areas of hazard assessment and vulnerability reduction. The establishment of an international fund to backstop reinsurance schemes, to support private-public partnerships, or to backstop national disaster funds while they are in their infancy, may assist in rendering certain climate risks insurable. Such a fund might also provide necessary support to public-private insurance schemes that link insurance availability with incentives to reduce vulnerability and enhance resilience. These sorts of schemes have already proven quite successful in combining risk transfer with risk reduction strategies in disaster-prone communities (e.g. Turkish catastrophe insurance fund; see Linnerooth-Bayer et al. (2003)). The original AOSIS insurance proposal should additionally be revisited, as it offers a potential structure for a collective loss sharing arrangement for addressing the impacts of sea level rise.

3.2 Political leadership

While the content of a future climate agreement raises a number of challenges relating to mitigation, adaptation and funding, the process of achieving such an agreement is deeply political and worth detailed analysis. The roles of key players such as the US, the EU, G77 and China, and other parties need to be analysed with respect to their leadership potential.

3.2.1 *The political situation: international stagnation, domestic progress*

The international climate regime is at a crossroads again. More than six years have passed since the adoption of the Kyoto Protocol, but the treaty, the first attempt to seriously limit the emission of GHGs into the atmosphere, has still not entered into force. Although with 122 ratifications the protocol is on the way to become a universal treaty, the refusal by the USA and the reluctance by the Russian Federation to ratify have prevented its coming into effect. Whereas the absence of the US appears to be a longer-term constraint on the regime (see below), the delay of ratification by Russia is the result of a multitude of factors that might change quickly – in either direction.

According to the revitalized ‘Kremlin astrology’ of the Cold War, this reluctance is in part motivated by internal political and economic factors and partly by pressure from the US. Nevertheless, there is a good chance that Russia will eventually ratify: According to a study conducted by the University of Kassel and Russian scientists from the Academy of Sciences, the Russian agrarian sector would not profit from climate change (Alcamo et al. 2003), the overall impact of ratifying the protocol on the Russia economy could be quite beneficial (Grubb 2004) and, according to financial analysts, Russia could earn up to \$10 billion from the sale of emission allowances (Point Carbon 2003). For the present effort, however, the question of Russian ratification is not the decisive factor. Whether or not the Kyoto Protocol will enter into force, the basic political conditions governing the strategy of the EU or other countries interested in a progressive climate regime remain remarkably similar (Oberthür/Ott 2004). Some of these conditions will be explored in the next paragraphs.

The inclusion of the US in the climate regime has always been considered vital – first, because it emits one quarter of global emissions and, second, regime building without the last remaining superpower

appeared to be rather futile. After the Bush presidency, the administration of President Clinton gradually developed a more positive approach towards the climate regime. The appointment of Eileen Claussen in the State Department in 1996 preceded the acceptance of binding emission targets and Vice-President Al Gore flew to Kyoto instructing his negotiators ‘to show increased flexibility’. Nevertheless, a strong opposition in the Senate and its Foreign Relations Committee under Jesse Helms prevented any move towards ratification of the protocol.

In March 2001 the newly elected president George Bush announced in a letter to senators his ‘opposition’ to the Kyoto Protocol. However, a concerted diplomatic effort of the EU and other countries around the world secured that the US would not prevent the adoption of the Bonn Agreement and the Marrakesh Accords in 2001. Internally, the national climate strategy of 14 February 2002 (US 2004) has a strong focus on bilateral support for mitigation in developing countries and relies on voluntary efforts by industry. The strategy aims at reducing emissions by 18% until 2012 – relative to economic growth. This goal merely extends an existing trend towards lesser energy intensity, slows down the growth rate of US emissions but would ultimately nevertheless lead to an overall increase in emissions of about 30% by 2012 compared to 1990 (RIVM 2002).

This picture would not be complete, however, without taking note of the many sub-federal activities (Rabe 2002; CCAP 2002; WWF 2003). Many cities and local communities have initiated climate-related measures, like Seattle, which plans to meet Kyoto targets locally and implement practical projects (Seattle City Lights). Furthermore, a number of states have voluntarily accepted climate targets (e.g. New York and New Jersey) or cooperate in a climate action plan like the New England States. Even Texas, home of President Bush, developed a programme to foster wind energy and established a minimum-percentage of energy production for renewable energies. Although these developments are not insignificant (the total GHG emissions of Texas are comparable to those of France) and may eventually shape policy at the national level, they are no substitute for an effective policy at the federal level.

The EU, by contrast, has taken a more proactive approach towards effective climate policy. Internationally, it collaborated with the G77 by forming the so-called Green Group in Berlin 1995, it pushed negotiations towards conclusion in Kyoto 1997 and it prevented a collapse of the climate regime after President

Bush in March 2001 announced his opposition to the Kyoto Protocol. The Union has fulfilled its obligations under the UNFCCC: its CO₂ emissions in the year 2000 were 0.5% below those of 1990, total GHG emissions were down by 3.5%. However, these emission trends are not stable and without new measures the EU may miss its target for the first commitment period (EU 2003).

Internally, the EU has adopted the European Climate Change Programme with its central cornerstone, the EU-wide emissions trading system. This was adopted on 2 July 2003 and as of 1 January 2005 companies from sectors covered by the scheme must limit their CO₂ emissions to allocated levels in two periods, from 2005–2007 and 2008–2012. The emissions trading system is complemented by a multitude of other measures in the energy, transport and other sectors (EU 2001). While these measures may not be sufficient to reach the ambitious goals of the Union, they nevertheless provide the first steps of a strategy to steer away from energy intensive and fossil based development. In contrast to the prevalent fears in the US, this climate strategy appears not to have impeded economic development.

Developing countries are not yet subject to emission regulations under the climate regime. Emissions have been rising and sometime between 2015 and 2020 annual emissions are projected to equal those of industrialised countries. However, taking cumulative emissions into account, developing countries' emissions would only exceed industrialised countries' emissions by the middle of the century (den Elzen/Schaeffer 2002); and per capita emissions in most developing countries are a tiny fraction of those in industrialised countries.

Nevertheless, individual countries like China have in the past years considerably decreased their emissions of GHGs, partly in order to save scarce energy and partly in order to fight local air pollution. India has developed a domestic wind industry and used to provide leadership in the climate negotiations. This was essential in bringing about the Green Group of developing countries at COP 1 in Berlin, which entered into a strategic alliance with Europe to bring about the Berlin Mandate. A similar process took place before and in Marrakesh to save the Kyoto Protocol from its most imminent danger after the failure of COP 6 in The Hague (Ott 2001). For the last years India appears to have entered into an informal alliance with China and Brazil for the purpose of leading the G77 and China bloc. This informal group is the only adversary of the very active group of Arabic oil exporting countries

(OAPEC) that has enjoyed a disproportionately high degree of influence within the G77.

For geographical reasons and because of a lower capacity to adapt, developing countries are particularly vulnerable to climate change. This is the reason why AOSIS, a group of low-lying islands and coastal states, has for a long time played a leadership role as the 'moral conscience' of the regime and as the main agent for stronger measures. However, with the adoption of the Kyoto Protocol and the host of technicalities in the follow-up process, much of this impetus has gone. Since Marrakesh, the AOSIS group with a membership of more than 40 countries appears to have entered into an alliance with the group of LDCs (49 countries, partly overlapping with AOSIS), which are particularly vulnerable to climate change as well. Most efforts of this alliance at the moment are directed towards securing financial assistance under the various funds of the Convention or the Protocol. Both groups so far have not made a concerted attempt to chart the course for further development of the climate regime, despite their common interest in avoiding the consequences of climate change.

The identification of political interests is critical in forging alliances between different groups of developing countries. The governments of OPEC, for example, share a common interest in protecting their revenues from oil production, not dissimilar to other countries that depend on coal. In general, of course, developing countries share a common interest in 'development' in the sense of developing the economic capability to meet basic human needs of their people. RIDCs, almost by definition, have an interest in further industrialisation. However, the NICs have perhaps 'arrived' in this respect at least as much as non-Annex II Annex I Parties, as reflected in the capability criteria in Table 1. Identifying sets of interest across political divides will be critical in forging a Green Group that can drive an equitable and adequate global climate agreement.

3.2.2 *Leadership in the climate regime*

The EU has so far largely fulfilled the role the US has left void – namely that of the engine of the regime. However, leadership roles can change as the ozone negotiations have shown: whereas until 1989 the US was pushing for stronger measures in the framework of the Montreal Protocol, it fell back to a laggard position afterwards and the baton was taken up by Europe. It is not inconceivable that the US at some point may assume a leadership role in the climate regime. This is not to be expected soon, however.

Experience in international environmental governance indicates that in order to achieve progress in regulation, leadership by a strong country or group of countries is required. This is not the call for a hegemon as a prerequisite for regime building, as pronounced by the theory of hegemonic stability (Gilpin 1981; Kindleberger 1988), but an acknowledgement of the fact that uphill negotiations need a strong pusher. Leadership can take different forms that have been referred to in various terms by various authors. In particular, the following distinctions can be made (Gupta/Grubb 1999, Oberthür/Ott 1999). First, a leader may make use of general political and economic weight, referred to as structural leadership. Second, leadership in international negotiations often requires the skilful building of coalitions and alliances, sometimes referred to as instrumental leadership. Third, and perhaps most importantly, leadership is advanced effectively by demonstrating solutions to others, i.e. directional leadership. Domestic action, in the form of leadership by example, is a decisive element of this third factor. The EU has at different stages of the negotiations employed one or more of these leadership qualities, but it lacks a coherent strategy that is persistent over a longer period of time. Equally often the Union appears weak, fragmented and structurally incapable of exercising effective leadership.

This, however, is urgently required for a progressive development of the climate regime. There are examples for regime building without a hegemon, but there is as of yet no example in international environmental policy for successful regime building *against* a hegemon. The term hegemony, derived from the old Greek *hegesthai* (to lead), is most often used to describe a power structure characterised by a great difference in the military, political and economic strength of one country versus other countries and that cannot be altered unilaterally by another state or group of states. The US may be described as such a hegemon, not only globally, but also regarding climate change because of its share of emissions and because of its political and economic potential to contribute to a successful solution.

In 2002, however, the US changed its position from a *laissez-faire* approach to one of opposition to the Kyoto Protocol. This is evidenced by the forked strategy towards developing countries: whereas at home the unwillingness of the South to take on commitments is portrayed as unfair to its industry and thus an obstacle for ratification, in New Delhi the US chief negotiator Harlan Watson stated that ‘we must recognize that it would be unfair – indeed counterproduc-

tive - to condemn developing nations to slow growth or no growth by insisting that they take on impractical and unrealistic greenhouse gas targets’ (Watson 2002). Furthermore, the US has employed bilateral diplomacy and entered into fourteen bilateral treaties with Annex I countries (Australia, Canada, Italy, Japan, Russia) and developing countries (e.g. China, India, Mexico). There is nothing wrong with bilateral diplomacy, but in the absence of multilateral efforts this runs the risk of undermining the protocol.

The obstruction of the Kyoto Protocol might not be an officially announced strategy, but it is nevertheless factual policy. The climate community therefore faces the task of stabilising and evolving the regime against opposition of the world’s major player. There are at least two well-known examples where large parts of the global community successfully established a regime against the will of the US: both the negotiations on a landmine treaty and on the International Criminal Court have shown that a dedicated NGO community together with key countries are able to overcome US opposition. The Landmines Treaty of 1997 has been ratified by 140 countries and despite the non-ratification by the US, Russia and China the production, stockpiling and use of landmines has been reduced drastically (Human Rights Watch 2003). In fact, the trade in anti-personnel landmines has gone down to zero. Second, the International Criminal Court (ICC) is established and has been ratified by almost 100 countries. The establishment of the ICC is perhaps even more significant, since the current US administration is employing bilateral diplomacy in attempts to undermine the legitimacy and effectiveness of the court (Becker 2003).

Differences between these issues and climate change should not be overlooked, however. Neither the Landmines Treaty nor the establishment of the ICC involved economic and social decisions and ramifications on a comparable scale: averting climate change does imply a complete restructuring of the way our economies produce and consume. Second, support for the Landmines Treaty and the ICC from European and other countries was less ambivalent than in the case of the climate regime - maybe partly because of these economic implications. However, apart from a genuine concern over the disruption of the climate system, the desire to unify and strengthen external policy of the EU has in the past provided sufficient momentum to push the process forward (Hovi et al. 2003).

3.2.3 Leadership strategies

The USA will not ratify the Kyoto Protocol in the foreseeable future. Even a change in the presidency would not affect the composition of the Senate, which must accept international treaties with a two-thirds majority. Voters in the US tend to balance a Democratic President with a Republican Senate. Proposals for a realistic strategy must take this fact into account. The world has embarked on the ambitious goal of preventing dangerous interference with the climate system – and it has decided on a global structure and institutions of how to deal with it. Political or diplomatic pressure from outside might have only minor impact on US policy – internal political processes alone will lead to change. These internal political processes can and should be supported from outside, however.

As a first pillar of a successful strategy, therefore, alternative avenues of co-operation with and engaging the US outside of the Kyoto regime should be explored. Support (and possibly funding) of sub-federal entities like states, local communities, scientific and advocacy groups in the US has the potential to change the political climate and thus increase pressure at the domestic level. Implementing climate policies at the sub-federal level will furthermore increase the chances of re-integrating the US in the climate regime, since otherwise the implementation gap would increase even further. However, the taking on of substantive quantitative commitments by developing countries would probably be dependent on a full-scale re-entry of the US into the climate regime.

Sometimes it is also suggested that the EU and other trading partners employ trade-related measures compatible with the WTO in order to offset potential comparative disadvantages arising from climate policies (Biermann/Brohm 2003). However, there are many ways of co-operation with federal and sub-federal actors, comprising the following, *inter alia*:

At the federal level:

- Scientific co-operation with a strong emphasis on the IPCC.
- Technological co-operation like the Hydrogen initiative of 16/17 June 2003 or the Carbon Sequestration Leadership Forum signed on 25 June 2003 between the EU, the US and other industrialised countries.
- Political co-operation on certain policies like the establishment of standards for production and consumption or renewable energies (e.g. in the context of ‘renewables 2004’, the conference on renewable energy, June 2004 in Bonn).

At the state and community level:

- Increased flow of information with state and local governments, legislators, NGOs and the respective industry on policies and technologies.
- Agreements with entities on the state and community level.

At the private level:

- Support for US-based and international NGOs working on US policy at the community, state and federal level.
- Support for and co-operation with US-based scientific institutions (PEW, CCAP, UCS, WRI, Worldwatch, etc; but also institutions dealing with the science of climate change might need support);
- Fostering and facilitation of business-to-business conferences between the US and European/Japanese companies and initiatives furthering the exchange of information.

A second pillar of a climate strategy in the years to come consists of a firm commitment by all Kyoto Parties towards the Kyoto Protocol and the Marrakesh Accords. This means first of all to prepare implementation of its commitments as if it was in force already. Furthermore, the protocol should form the basis of any negotiations for the time after 2012 and preserving the integrity of the Kyoto Protocol should be the guiding principle even in the case that Russia refuses to ratify. Any attempt to start from a clean slate with a ‘Plan B’ would be equivalent to opening Pandora’s box and unleash destructive forces that could severely damage all efforts aimed at climate protection for a considerable time.

There are at least two ways to enact the Kyoto Protocol without Russia, thereby avoiding the dangers of negotiating a new treaty: For example, Article 25 of the Kyoto Protocol could be modified, which governs the entry into force of this treaty and requires that industrialised countries must represent 55 percent of the 1990 industrialised country emissions. Alternatively, the Kyoto Protocol could be applied provisionally, as has been done in the case of the GATT for several decades, which was based on a provisional application of the Statute of the International Trade Organization that never entered into force. The Parties to the Kyoto Protocol should therefore meet in order to discuss the situation and develop a strategy to deal with the uncertainty caused by the Russian failure to ratify.

Third, the EU will have to play an equally strong role as in the past if it wants progress on climate change – and probably more. This concerns on the one hand the capacity to compete diplomatically with the United States, but it concerns especially the relationship with the South. Since COP 8 in New Delhi, diplomatic relations between the EU and developing countries are strained and need a conscious rebuilding (Ott 2002). As experiences with overcoming obstacles in the past have demonstrated, progress in the climate regime was usually dependent on a good understanding between the EU and developing countries. This requires first of all an open ear for the needs and fears of the South and, second, the willingness to provide substantial financial means for mitigation and adaptation activities. In fact, the EU (plus Canada and Japan) must at least make up for the (financial) gap that was left by the refusal of the US to engage in the Kyoto Protocol. This compensation is particularly important concerning travel costs for LDC delegates for COP/MOPs and other important meetings. The EU should furthermore explore possibilities for co-operation with developing countries on a plurilateral basis. The establishment of an International Renewable Energy Agency (IRENA), for example, possibly as an outcome of the international renewable energy conference June 2004 in Bonn would not require universal participation and might be of great importance for technological progress and as a political sign for developing countries.

It is not yet discernible what kind of impact the enlargement of the EU in May 2004 to a community of 25 countries will have on its ability to play a strong role internationally. Of course, its economic and political weight will increase along with the increase in population and markets. However, the new member states will add additional interests and thus complexity. Merging the economies and societies of Eastern Europe into the EU will demand a great deal of attention and this might lead to an even more inward-looking attitude of the Union than usual. Furthermore, financially the enlargement might negatively affect the ability to co-operate with developing countries due to the large financial flows from West to East that will decrease the North-South transfers. And finally, the new accession countries will not be part of the EU burden sharing agreement ('bubble') but covered by the internal Emissions Trading System. This will lead to conflicts of interest when the system is linked with CDM activities: whereas the Western members have an incentive to include CDM activities, the new member states fare best when the role of the CDM is kept low, since this will limit the supply of allowances and thus raise their revenues.

At the process level, the increased number of countries after May 2004 will threaten to further stifle the negotiation capacity of the EU. Certainly, improved negotiation tactics and strategies since 1997 have considerably enhanced the Union's diplomatic performance, partly supported by technological developments like mobile phones (Oberthür / Ott 1999: 83). There is a chance that the adoption of a European Constitution – which failed to get adopted last year but may be approved in 2004 – will compensate for the increased complexity (Schaik / Egenhofer 2003). In any case it can be expected that the enlargement will have a profound impact on the EU in the years 2005 et seq. – exactly those years where the second commitment period (or an enactment without Russian ratification) is supposed to be negotiated. These conditions will require careful and determined leadership by the respective country holding the presidency in the Union. The United Kingdom will have an especially important role in the medium term, since it will not only hold the EU presidency in the latter half of 2005, but also chair the G8 at the same time.

Fourth, developing countries can only regain their leadership qualities if they rethink their role in the climate negotiations, thus rendering their negotiating position more effective (Athanasidou / Baer 2002). This concerns individual countries as well as the group as such. As regards the group, the fixation on the G77 and China bloc – historically with good reasons – has led to stagnation, since the diverging and sometimes conflicting interests of such a diverse group of countries tends to lead to agreement on the lowest common denominator. It is thus of paramount importance to realise these differences and make serious attempts at reconciling and co-ordinating a best possible outcome. This would also pave the way for a creative, practical and forward-looking mode of differentiation – a key element of any climate regime post-2012 (see section 2.3).

The sober analysis of strengths and weaknesses of various developing countries as well as acknowledgement of the differences within developing countries would furthermore improve the chances for coalition building with the European Union. However, more important appears to be the careful coalition building within the G77 and China in order to foster leadership. An adequate response of that bloc towards the threat of climate change has so far been prevented by the work of OPEC, in particular the group of Arabic countries within OPEC. Part of the political strategy will require treating OPEC countries similarly to laggard Annex I countries – challenging them to participate construc-

tively, isolating them where they remain obstructive and not allowing this group to block action by the G77 and China.

This can only be countered by a large coalition of countries, including China, India and Brazil, and supported by a second layer of rapidly industrialising countries like South Africa and Thailand. Incidentally, this is also the group of countries that might most reasonably be expected to take on some form of climate commitment. Such a coalition has something of a precedent in the G 20 Group of countries¹³ that were instrumental in voicing developing country interests in the WTO negotiations at Cancun. This coalition to support an effective and equitable global climate agreement would be supported by AOSIS, which has a vital interest in a successful climate regime. LDCs would probably participate in such a coalition if there is sufficient action on adaptation/sustainable development. NGOs are likely to support such an alliance.

Fifth, there is a range of options for civil society actors to adapt to new challenges posed by the complexity of the climate challenge, accelerating globalisation processes and the unilateral attitude of the USA. This does not only refer to NGOs, civil society's well-known agents, but also to other actors, individuals and loose networks of citizens. Despite the gravity of the threat posed to life, health and property of people around the world, a 'climate movement' is still lacking. These threats to life, health and property caused by climate change are as real as those posed by economic globalisation processes. But in stark contrast to the developments in the anti-globalisation movement, this message appears not to have come across. Possibly, new and creative ways of protesting and networking will have to be developed to foster a global climate movement.

As regards NGOs, the Climate Action Network (CAN) is already well equipped and has proven one of the most effective tools for global policymaking (Waddell 2003). The establishment of a CAN international secretariat in Bonn is one further step to improve its effectiveness. Further improvements are possible, however, and ways to learn from the campaign to ban landmines and the coalition for an International Criminal Court should be studied. The lesson of widest possible participation is particularly important, especially in the years to come. While the larger organisations like Green-

peace and WWF have a policy to fund their Southern members, smaller organisations find it increasingly difficult to participate effectively in the negotiations. Furthermore, the integration of development organisations (like Oxfam or ActionAid) would considerably improve credibility and effectiveness of NGO-lobbying. NGOs might furthermore explore whether they could play a strong role in the processes or institutions that might result from the conference 'renewables 2004' in June 2004 and maybe even become part of such an institutional structure. The CURES coalition (Citizens United for Renewable Energy and Sustainability) that was established in October 2003 could be a first and forward-looking step in this direction.

The NGO community might also attempt to gain increased influence on domestic policy in the US. If it is true that policy change in the US will have to come from within, the achievement of a more favourable political climate in this one country is a top priority for domestic and international organisations alike. The US may be a hegemonic power, but it is not monolithic. National environmental organisations could be supported, even financially (the crash of the new economy and the decline of the stock markets has dried up many financial resources). Campaigns might be co-ordinated not only among domestic groups and organisations, but also with international ones and those of other countries. Needless to say that Southern NGOs and Southern civil society are crucial for the future of the climate regime – any support for those groups and individuals enhances the chances to win allies among developing countries.

Finally, NGOs might play an even more active role in facilitating a rapprochement between the EU and the South. They might furthermore have an important role in the process of differentiation between developing countries. If NGOs cannot agree on credible, effective and pragmatic solutions for differentiating within the G77 and China, prospects for agreement among politicians and negotiators are rather low.

13 Argentina, Bolivia, Brazil, Chile, China, Columbia, Costa Rica, Cuba, Ecuador, Egypt, El Salvador, Guatemala, India, Mexico, Pakistan, Paraguay, Peru, Philippines, South Africa, Thailand and Venezuela.

References

- Alcamo, J., N. Dronin, M. Endejan, G. Golubev and A. Kirilenko (2003): "Will Climate Change Affect Food and Water Security in Russia?". WZ Report A0302. Kassel: Center for Environmental Research, University Kassel.
- Alley, R.B., J. Marotzke, W.D. Nordhaus, J.T. Overpeck, D.M. Peteet, R.A. Pielke Jr., R.T. Pierrehumbert, P.B. Rhines, T.F. Stocker, L.D. Talley and J.M. Wallace (2003): "Abrupt climate change". *Science* (299), 2005–2010.
- Athanasiou, T. and P. Baer (2002): "Dead Heat: Global Justice and Global Warming". New York: Seven Stories Press.
- Azar, C. and H. Rodhe (1997): "Targets for Stabilization of Atmospheric CO₂". *Science* (276), 1818–1819.
- Baumert, K., O. Blanchard, S. Llosa and J. F. Perkaus (Eds.) (2002): "Building on the Kyoto Protocol: Options for protecting the climate". Washington DC: World Resources Institute. http://climate.wri.org/pubs_pdf.cfm?PubID=3762.
- Becker, E. (2003): "U.S. Suspends Aid to 35 Countries over New International Court". *New York Times*, 2 July 2003.
- Biermann, Frank and Rainer Brohm (2003): "Implementing the Kyoto Protocol Without the United States. The Strategic Role of Energy Tax Adjustments at the Border. Global Governance Working Paper No.5". Potsdam, Berlin, Oldenburg: The Global Governance Project. <http://www.glogov.org/upload/public%20files/pdf/publications/working%20papers/workingpaper5.pdf>.
- Caldeira, K., A. Jain and M. Hoffert (2003): "Climate sensitivity uncertainty and the need for energy without CO₂ emissions". *Science* (299), 2052–2054.
- CAN (Climate Action Network) (2002): "Preventing dangerous climate change". CAN Position Paper. <http://www.climnet.org/pubs/CAN-adequacy30102002.pdf>.
- CCAP (Center for Clean Air Policy) (2002): "State and Local Climate Change Policy Actions". Washington DC: CCAP.
- Den Elzen, M. and M. Schaeffer (2002): "Responsibility for past and future global warming: uncertainties in attributing anthropogenic climate change". *Climatic Change* (54), No.1–2, 29–73.
- Den Elzen, M and A. De Moor (2001): "The Bonn Agreement and Marrakesh Accords: an updated evaluation". Report 728001017. Bilthoven: RIVM.
- Dickson, B., I. Yashayaev, J. Meincke, B. Turrell, S. Dye and J. Hoffort (2002): "Rapid Freshening of the Deep North Atlantic Ocean Over the Past Four Decades". *Nature* (416), 832–836.
- EU-Council of the European Union-Environment (2002): "2457th Council Meeting-Environment". 17 October 2002, Luxembourg. <http://ue.eu.int/newsroom/make-frame.asp?MAX=1&BID=89&DID=72808&LANG=1&File=/pressData/en/envir/72808.pdf&Picture=0>.
- EU-Commission of the European Community (2003): "World Energy, Technology and Climate Policy Outlook (WETO)". May 2003.
- EU-Commission of the European Communities (2001): "Communication from the Commission on the Implementation of the First Phase of the European Climate Change Programme". COM 580, Brussels, 23.10.2001.
- Gilpin, R. G. (1981): "War and Change in World Politics". New York: Cambridge University Press.
- Grubb, M. (2004): "Jumping to Conclusions on Kyoto". *Moscow Times*, 9 January 2004, p.8. <http://www.themoscowtimes.com/stories/2004/01/09/006.html>.
- Grubb, M., C. Vrolijk and D. Brack (1999): "The Kyoto Protocol: A guide and assessment". London: Royal Institute for International Affairs.
- Gupta, J. and M. Grubb (1999): "Climate Change and the Leadership Paradigm: Options for the European Union". Dordrecht: Kluwer.
- Hare, William (2003): "Assessment of Knowledge on Impacts of Climate Change—Contribution to the Specification of Art. 2 of the UNFCCC: Impacts on Ecosystems, Food Production, Water and Socio-economic System. Expertise for the WBGU Special Report 'Climate Protection Strategies for the 21st Century: Kyoto and Beyond'". www.wbgu.de/wbgu_sn2003_ex01.pdf.
- Hovi, J., T. Skodvin and S. Andresen (2003): "The Persistence of the Kyoto Protocol: Why Other Annex I Countries Move on Without the United States". *Global Environmental Politics* (3/4), 1–23.
- Human Rights Watch (2003): "Landmine Monitor Report 2003: Toward a Mine-Free World". Washington: Human Rights Watch. <http://www.icbl.org/lm/2003>.
- Huq, Saleemul (2002): "The Bonn-Marrakech agreements on funding". *Climate Policy* (2), Nos. 2–3, 243–246.
- IPCC (2001a): "Climate Change 2001: The Scientific Basis". Cambridge: Cambridge University Press.

- IPCC (2001b): "Climate Change 2001: The Impacts, Adaptation, and Vulnerability". Cambridge: Cambridge University Press.
- IPCC (2001c): "Climate Change 2001: Mitigation". Cambridge: Cambridge University Press.
- IPCC (1999): "Special Report on Emission Scenarios". Cambridge: Cambridge University Press.
- Kindleberger, C. (1988): "International Public Goods Without International Government". In: Charles Kindleberger (ed.): *The International Economic Order: Essays on Financial Crisis and International Public Goods*, Cambridge: The MIT Press, 123–142.
- La Rovere, E. L., L. V. de Macedo and K. Baumert (2002): "The Brazilian Proposal on relative responsibility for global warming". In: K. Baumert, O. Blanchard, S. Llosa and J. F. Perkaus (Eds.): *Building on the Kyoto Protocol: Options for protecting the climate*. Washington, DC: World Resources Institute, 157–174. http://pdf.wri.org/opc_chapter7.pdf.
- Linnerooth-Bayer, J., M.J. Mace, R. Verheyen and K. Compton (2003): "Insurance-Related Actions and Risk Assessment in the Context of the UNFCCC". Background paper for UNFCCC workshop, May 2003. <http://unfccc.int/sessions/workshop/120503/documents/background.pdf>.
- Mace, M. J. (2003): "Adaptation under the UN Framework Convention on Climate Change: the Legal Framework". Paper presented at Zuckerman Institute for Connective Environmental Research, University of East Anglia, September, 2003.
- Oberthür, S. and H. E. Ott (2004): "Framing Climate Policy Beyond Kyoto: Looking Back to Move Forward". In: David Michel (Ed.): *Climate Policy for the 21st Century. Meeting the Long-term Challenge of Global Warming*. Washington DC: Center for Transatlantic Relations, 3–33.
- Oberthür, S. and H. E. Ott (1999): "The Kyoto Protocol. International Climate Policy for the 21st Century". Berlin: Springer Verlag.
- Ott, H. E. (2002): "Warning Signs from Delhi: Troubled Waters Ahead for Global Climate Policy". Published under the title "Global Climate". In: *Yearbook of International Environmental Law 13 (2002)*, 261–270. <http://www.wupperinst.org/download/Warning-Signs-Ott.pdf>.
- Ott, H. E. (2001): "Climate Change: An Important Foreign Policy Issue". *International Affairs (77)*, No. 2, 277–296.
- Ott, H. E. and W. Sachs (2002): "The ethics of international emissions trading". In: L. Pinguelli-Rosa and M. Monasinghe (Eds.): *Ethics, Equity and International Negotiations on Climate Change*. Northampton: Edgar Elward Publ. 159–178.
- Pan, Jiahua (2002): "Understanding human development potentials and demands for greenhouse gas emissions: with empirical analysis using time series and cross-sectional data". Beijing: Chinese Academy of Social Sciences.
- Point Carbon (2003): "Russia could earn 10 bn USD from ratifying the Kyoto Protocol", 08.07.03. <http://www.pointcarbon.com/article.php?articleID=2325>.
- Rabe, B. G. (2002): "Greenhouse & Statehouse. The Evolving State Government Role in Climate Change". Washington DC: Pew Center on Global Climate Change. <http://www.pewclimate.org/document.cfm?documentID=186>.
- RIVM—National Institute for Public Health (2002): "Evaluating the Bush Climate Change Initiative". Bilthoven, The Netherlands. <http://www.rivm.nl/bibliotheek/rapporten/728001019.pdf>.
- Salim, Emil (2003): "Striking a better balance: The Extractive Industries Review". December 2003. <http://www.eireview.org/html/EIRFinalReport.html>.
- Schaik, L. van and C. Egenhofer (2003): "Reform of the EU Institutions: Implications for the EU's Performance in Climate Negotiations". CEPS Policy Brief no. 40 Brussels: Centre for European Policy Studies. <http://www.ceps.be/>.
- Schneider, S. and C. Azar, (2002): "Are Uncertainties in Climate and Energy Systems a Justification for Stronger Near-term Mitigation Policies?". Washington DC: Pew Center on Global Climate Change. <http://www.pewclimate.org/document.cfm?documentID=38>.
- Shukla, P R, F. Tudela, O. Davidson, S. Mwakasonda, R. Spalding-Fecher, H. Winkler, P. Mukheibir, S. Alpan-Atamer, W. J. Chandler, T. Secrest, J. Logan, R. Schaefer, A. S. Szklo, M. E. Schuler, Z. Dadi, Z. Kejun, Z. Yuezhong and X. Huaqing (2002): "Climate change mitigation in developing countries: Brazil, China, India, Mexico, South Africa, and Turkey". Washington DC: Pew Center on Global Climate Change. http://www.pewclimate.org/docUploads/dev_mitigation.pdf.
- Thomas, C., A. Cameron, R. Green, M. Bakkenes, L. Beaumont, Y. Collingham, B. Erasmus, M. Siqueira, A. Grainger, L. Hannah, L. Hughes, B. Huntley, A. van Jaarsveld, G. Midgley, L. Miles, M. Ortega-Huerta, A. Peterson, O. Phillips and S. Williams (2004): "Extinction risk from climate change". *Nature (427)*, 145–148.
- U.K. (United Kingdom) (2003): "Our energy future. Creating a low carbon economy. Energy White Paper". London: Department for Transport, Department for Environment, Food and Rural Affairs. http://www.dti.gov.uk/energy/whitepaper/wp_text.pdf.
- UN (United Nations) (2003): "Long-range World Population Projections: Based on the 1998 Revision". New York: United Nations Department of Economic and Social Affairs. <http://www.un.org/esa/population/publications/longrange/longrange.htm>.
- UNCTAD (United Nations Conference on Trade and Development): "The Least Developed Countries Report 2002. Escaping the Poverty Trap". New York and Geneva: United Nations. http://www.unctad.org/en/docs/ldc2002_en.pdf.

- UNDP (United Nations Development Programme) (2003): "Human Development Report 2003: Millennium Development Goals: A compact among nations to end human poverty". New York: UNDP. http://www.undp.org/hdr2003/pdf/hdr03_HDI.pdf.
- UNDP (United Nations Development Programme) (2002): "Human Development Report 2002. Deepening democracy in a fragmented world". New York: UNDP. <http://hdr.undp.org/reports/global/2002/en/pdf/complete.pdf>.
- UNFCCC (2003a): "Report on the national greenhouse gas inventory from annex I Parties for the period 1990–2001". FCCC/SBSTA/2003/14 (17 October 2003). Bonn: UNFCCC.
- UNFCCC (2003b): "Compilation and synthesis report on third national communications. Executive summary". FCCC/SBI/2003/7 (16 May 2003). Bonn: UNFCCC.
- UNFCCC (2003c): "Report of Subsidiary Body for Implementation on its eighteenth session, held at Bonn, from 4 to 13 June 2003". FCCC/SBI/2003/8 (31 July 2003). Bonn: UNFCCC.
- UNFCCC (2003d): "Report of the subsidiary body for implementation on its nineteenth session, held at Milan from 1 to 10 december 2003". FCCC/SBI/2003/19 (24 March 2004). Bonn: UNFCCC.
- UNFCCC (2002a): "Report of the Conference of the Parties on its eighth session, held at New Delhi from 23 October to 1 November 2002. Addendum 1". FCCC/CP/2002/7/Add.1 (28 March 2003). Bonn: UNFCCC.
- UNFCCC (2002b): "Financial mechanism. Review of the financial mechanism. Synthesis report. Note by the secretariat". FCCC/SBI/2002/14 (11 September 2002). Bonn: UNFCCC.
- UNFCCC (2001a): "Report of the Conference of the Parties on its seventh session, held at Marrakesh from 29 October to 10 November 2001. Part two: Action taken by the Conference of the Parties. Volume 2". FCCC/CP/2001/13/Add.2 (21 January 2002). Bonn: UNFCCC.
- UNFCCC (2001b): "Report of the Conference of the Parties on its seventh session, held at Marrakesh from 29 October to 10 November 2001. Part two: Action taken by the Conference of the Parties. Volume 1". FCCC/CP/2001/13/Add.1 (21 January 2002). Bonn: UNFCCC.
- UNFCCC (2001c): "Statements made in connection with the approval of the Bonn Agreements on the implementation of the Buenos Aires Plan of Action (decision 5/CP.6)". FCCC/CP/2001/MISC.4 (23 October 2001). Bonn: UNFCCC.
- UNFCCC (1997): "Implementation of the Berlin Mandate. Additional Proposals from Parties". FCCC/AGBM/1997/MISC.1/Add.3. (30 May 1997). Bonn: UNFCCC.
- US (2004): "Global Climate Change". Washington, DC: U.S. Department of State. <http://www.state.gov/g/oes/climate>.
- Verheyen, R. (2002): "Adaptation to the Impacts of Anthropogenic Climate Change—The International Legal Framework". *RECIEL* (11), No. 2, 29–143.
- Waddell, S.: "The Climate Action Network: Civil Society Tackling Global Negotiations". <http://www.gan-net.net/about/examples.html>.
- Watson, H. (2002): "Inputs to the Delhi Declaration. Remarks to the Eighth Session of the Conference of Parties (COP-8) to the UN Framework Convention on Climate Change." New Delhi, India. October 25, 2002. <http://www.state.gov/g/oes/rls/rm/2002/14758.htm>.
- Winkler, H., R. Spalding-Fecher and L. Tyani (2002a): "Comparing developing countries under potential carbon allocation schemes". *Climate Policy* 2 (4), 303–318.
- Winkler, H. R. Spalding-Fecher, S. Mwakasonda and O. Davidson (2002b): "Sustainable development policies and measures: starting from development to tackle climate change". In: K. Baumert, O. Blanchard, S. Llosa and J. F. Perkaus (Eds.): *Building on the Kyoto Protocol: Options for protecting the climate*. Washington DC: World Resources Institute, 61–87. http://pdf.wri.org/opc_chapter3.pdf.
- WRI (World Resources Institute) (2003): "Climate indicators analysis tool (CAIT). Version 1.5". Washington DC: WRI. <http://cait.wri.org>.
- WBGU (German Advisory Council on Global Change) (2003): "Climate Projection Strategies for the 21st Century: Kyoto and beyond. Special Report". Berlin: WBGU. http://www.wbgu.de/wbgu_sn2003_engl.pdf.
- WWF (2003): "Rising Tide: Growing Momentum on Global Warming in the US"; presented at the Conference of the Parties to the FCCC, Milan, Italy, December 4.
- Yohe, G (2001): "Mitigative capacity—the mirror image of adaptive capacity on the emissions side: An editorial". *Climatic Change* (49), 247–262.

Annex 1:

Lists of countries included in country groups

	Annex II	NAII Annex I	NIC	RIDC	Other DC	LDC	
1	Australia	Belarus	Bahrain	Algeria	Armenia	Afghanistan	1
2	Austria	Bulgaria	Brunei*	Antigua & Barbuda	Azerbaijan	Angola	2
3	Belgium	Croatia	Cuba	Argentina	Bolivia	Bangladesh	3
4	Canada	Czech Republic	Israel	Bahamas	Cameroon	Benin	4
5	Denmark	Estonia	Kazakhstan	Barbados	Congo	Bhutan	5
6	Finland	Hungary	Korea (South)	Belize	Cook Islands	Burkina Faso	6
7	France	Latvia	Kuwait	Bosnia & Herzegovina	Côte d'Ivoire	Burundi	7
8	Germany	Lithuania	Qatar	Botswana	Dominica	Cambodia	8
9	Greece	Poland	Saudi Arabia	Brazil	Ecuador	Cape Verde	9
10	Iceland	Romania	Singapore	Chile	Egypt	Central African Republic	10
11	Ireland	Russian Federation	Suriname	China	Gabon	Chad	11
12	Italy	Slovakia	Trinidad & Tobago	Colombia	Georgia	Comoros	12
13	Japan	Slovenia	Turkmenistan	Costa Rica	Ghana	Congo, Dem. Republic	13
14	Liechtenstein	Turkey	United Arab Emirates	Cyprus	Guatemala	Djibouti	14
15	Luxembourg	Ukraine	Uzbekistan	Dominican Republic	Honduras	Equatorial Guinea	15
16	Monaco			El Salvador	India	Eritrea	16
17	Netherlands			Fiji	Indonesia	Ethiopia	17
18	New Zealand			Grenada	Jamaica	Gambia	18
19	Norway			Guyana	Kenya	Guinea	19
20	Portugal			Iran	Kyrgyzstan	Guinea-Bissau	20
21	Spain			Jordan	Libya	Haiti	21
22	Sweden			Lebanon	Macedonia, FYR	Kiribati	22
23	Switzerland			Malaysia	Moldova	Laos	23
24	United Kingdom			Malta	Mongolia	Lesotho	24
25	United States of America			Mauritius	Morocco	Liberia	25

	Annex II	NAII Annex I	NIC	RIDC	Other DC	LDC	
26				Mexico	Namibia	Madagascar	26
27			Oman		Nicaragua	Malawi	27
28			Panama		Nigeria	Maldives	28
29			Peru		Pakistan	Mali	29
30			Philippines		Papua New Guinea	Mauritania	30
31			Saint Kitts & Nevis		Paraguay	Mozambique	31
32			Saint Lucia		Seychelles	Myanmar	32
33			Saint Vincent & Grenadines		Sri Lanka	Nepal	33
34			South Africa		Swaziland	Niger	34
35			Thailand		Syria	Rwanda	35
36			Tunisia		Tajikistan	Samoa	36
37			Uruguay		Venezuela	Sao Tome & Principe	37
38					Vietnam	Senegal	38
39					Zimbabwe	Sierra Leone	39
40						Solomon Islands	40
41						Somalia	41
42						Sudan	42
43						Tanzania	43
44						Togo	44
45						Tuvalu	45
46						Uganda	46
47						Vanuatu	47
48						Yemen	48
49						Zambia	49

Due to a lack of data Cook Islands, Iraq*, Korea (North), Marshall Islands, Micronesia, Nauru, Niue, Palau, Serbia & Montenegro, San Marino and Tonga, are not included in any list.

* Non-Party to the UNFCCC.

Data source: WRI (2003). Groupings are based on authors' analysis.

Annex 2: 'South-North Dialogue – Equity in the Greenhouse': project outline

The Wuppertal Institute for Climate, Environment and Energy (Germany) and the Energy Research Centre (ERC, South Africa) have initiated a 'South-North Dialogue' between 14 institutions from developing as well as industrialised countries (see list of participants below). The present report reflects the results of this dialogue project.

Objective of the 'South-North Dialogue'

The purpose of the 'South-North Dialogue' was to discuss building blocks of a future international framework to combat climate change in a participatory manner. The discussion comprised issues related to mitigation as well as adaptation and was based on the underlying principles of equity, adequacy, and development. Key objective of the 'South-North Dialogue' was the elaboration of concrete policy recommendations that are compatible with the specific needs of politicians in the next few years but are also embedded in a long-term framework built upon the three pillars mentioned above.

Project participants

The composition of the project group aimed at a balance between the perspectives and concerns of the developing and industrialised world. Furthermore, it also represents the regions and countries that are particularly vulnerable to the effects of climate change and/or hold the strongest potential to combat climate change and its effects. An additional criterion for choosing the institutions involved was their research record regarding the further development of the climate change regime.

Process of the dialogue

The kick-off workshop of the project was held in June 2003 in Wuppertal. It was carried out in an open manner thereby allowing that suggestions by participants on procedure, as well as on the substance of the project, could be taken into account. After an in-depth discussion about the potential scope and topics of the

'South-North Dialogue' the participants agreed on its structure and content and identified seven building blocks of a possible future climate regime. These building blocks were further discussed among specialised sub-groups during the following months in an e-mail dialogue.

Preliminary results of the project were presented during a side-event at COP 9 in Milan. Subsequently, a second workshop was held in Cape Town, South Africa in January 2004 during which concrete policy recommendations, based on the findings and outcomes of the earlier discussions, were discussed. The results of this workshop are reflected in this report.

A second phase of the project shall expand the dialogue to the political level, in order to foster mutual understanding and trust between negotiators and policy makers and thereby to facilitate future negotiations on a second commitment period. It is planned to organize workshops with high-ranking climate negotiators, which shall be as informal as possible, avoiding the restrictive atmosphere of official negotiations in order to enable a constructive exchange of positions. Apart from the discussion of the results of the first phase the main goal of these workshops will be the unbiased communication between the delegates themselves.

Further information on the project 'South-North Dialogue – Equity in the Greenhouse' is available at www.wupperinst.org/Sites/Projects/rg2/1085.html or contact Bernd Brouns (bernd.brouns@wupperinst.org) and Hermann Ott (hermann.ott@wupperinst.org).

Person	Organisation	Country/region
Steve Bernow (†) ¹	Tellus Institute	USA
Preety M Bhandari	The Energy and Resources Institute	India
Bernd Brouns	Wuppertal Institute for Climate, Environment and Energy	Germany
Ogunlade Davidson	Energy Research Centre, University of Cape Town	South Africa
Saleemul Huq	International Institute for Environment and Development	United Kingdom
Pan Jiahua	The Chinese Academy for Social Science	China
Sivan Kartha	Tellus Institute	USA
Andrzej Kassenberg	Institute for Sustainable Development	Poland
Yasuko Kameyama	National Institute for Environmental Studies	Japan
Izumi Kubota	National Institute for Environmental Studies	Japan
Emilio Lèbre La Rovere	Federal University of Rio de Janeiro	Brazil
Jürgen Lefevere ²	Foundation for International Environmental Law & Development	AOSIS
M J Mace	Foundation for International Environmental Law & Development	AOSIS
Hermann E Ott	Wuppertal Institute for Climate, Environment and Energy	Germany
Atiq Rahman	Centre for Advanced Studies	Bangladesh
Agus P Sari	Pelangi	Indonesia
Youba Sokona	Environnement et Développement du Tiers-Monde	Senegal
Fernando Tudela ³	El Colegio de Mexico	Mexico
Harald Winkler	Energy Research Centre, University of Cape Town	South Africa

1. Steve Bernow died on 5 July 2003. This report is dedicated to him.

2. Jürgen Lefevere left FIELD (and the project team) in August 2003 for the EU Commission (DG Environment).

3. Fernando Tudela became Under Secretary of Planning and Environmental Policies at the Ministry of the Environment and Natural Resources in October 2003.