

# Asian Perspectives on Climate Regime Beyond 2012

**Concerns, Interests and Priorities**



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# Table of Contents

<i>Foreword</i> _____	iv
<i>Acknowledgements</i> _____	v
<i>Abbreviations and Acronyms</i> _____	vi
<i>Executive Summary</i> _____	vii
Introduction_____	1
Case Studies	
China_____	9
India_____	19
Indonesia_____	31
Japan_____	39
Republic of Korea_____	49
Viet Nam_____	55
Rest of Asia-Pacific_____	63
Region-wide Assessment_____	71
Conclusions and Suggestions_____	83
References_____	87
Appendix	
<i>Template of the Agenda</i> _____	93
<i>List of Participating Organisations</i> _____	94

# Foreword

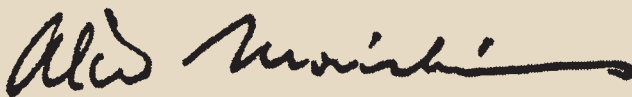
People often refer to the twenty-first century as the Asian century not only because of the region's huge population and rapid economic growth rates, but also due to the dynamism, diversity and development potential in the region. Yet, the region is home to nearly 1 billion poor people without access to modern energy services such as electricity. To what extent the vision of a sustainable Asia-Pacific would materialise obviously depends on policy choices and the political will to implement them now and in the near future.

Climate change is a major and long-term global environmental threat for the Asia-Pacific due to its high vulnerability, limited adaptive capacity and relatively poor institutional and human capacity. The design and governance of future international climate regime, therefore, has significant implications for realising the vision of a sustainable Asia. However, policy makers and negotiators from the region have often chosen to stay on the sidelines in international climate negotiations for various reasons. There is also a widespread feeling among Asian policy makers and other stakeholders that the current climate regime does not adequately address their interests, concerns and developmental aspirations.

In order to make rapid progress in addressing the challenge of climate change and to develop a constructive thinking for the future across the Asia-Pacific region, it is crucial first to ascertain the concerns, interests and priorities of each country with a view to build consensus on strengthening the current climate regime. The Institute for Global Environmental Strategies (IGES), being a policy-oriented research institution in the Asia-Pacific, decided to facilitate such discussions on an informal basis in 2005 and 2006, prior to suggesting the ways and means to build a future climate regime which can address Asian concerns more effectively than before. The goal of this report, which is the outcome of our consultations in 2005, is twofold: to identify and elaborate the concerns and interests of Asian countries on the future climate regime, and to highlight the priorities for restructuring or strengthening the future climate regime beyond 2012.

Although the decision to conduct the consultations was entirely of IGES, the task would not have been possible without effective cooperation from several partner organisations in the region. These include, but are not limited to, the Ministry of Environment (Indonesia), Ministry of Environment and Natural Resources (Viet Nam), the Energy and Resources Institute (India), the Energy Research Institute (China) and the Korea Environment Institute. I would like to thank the staff of these partner organisations in facilitating the process and request for their continued cooperation in the future.

I hope that the material presented in this report can ultimately contribute to the benefit of constructing a more effective, pragmatic and flexible climate regime.



**Prof. Akio Morishima**

President and Chair of the Board of Directors  
Institute for Global Environmental Strategies (IGES)

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We also thank the experts in various countries who kindly responded to our questionnaires on the climate regime beyond 2012, without which this report would have been incomplete.

# Abbreviations and Acronyms

<b>ADB</b>	Asian Development Bank	<b>IGCC</b>	Integrated gasification and combined cycle
<b>AGBM</b>	Ad Hoc Group for Berlin Mandate	<b>IMO</b>	International Maritime Organisation
<b>AJ</b>	Activities Implemented Jointly	<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>ALGAS</b>	Asia Least-cost Greenhouse Gas Abatement Strategy	<b>IPR</b>	Intellectual property rights
<b>AOSIS</b>	Alliance of Small Island States	<b>JVETS</b>	Japanese Voluntary Emissions Trading Scheme
<b>APEC</b>	Asia-Pacific Economic Cooperation	<b>kgoe</b>	Kilo gram oil equivalent
<b>ASEAN</b>	Association of Southeast Asian Nations	<b>kWh</b>	Kilowatt-hour
<b>BAU</b>	Business-as-usual	<b>LDC</b>	Least developed countries
<b>bb/d</b>	Barrels per day	<b>LULUCF</b>	Land-Use, Land-Use Change, and Forestry
<b>Btu</b>	British Thermal Unit	<b>MEAs</b>	Multilateral Environmental Agreements
<b>CCS</b>	Carbon capture and storage	<b>MtCO<sub>2</sub>e</b>	Metric tonnes of CO <sub>2</sub> equivalent
<b>CDM</b>	Clean Development Mechanism	<b>MtCO<sub>2</sub></b>	Metric tonnes of CO <sub>2</sub>
<b>CDM-EB</b>	CDM Executive Board	<b>Mtoe</b>	Metric tonnes of oil equivalent
<b>CER</b>	Certified Emission Reductions	<b>NGO</b>	Non-governmental organisation
<b>CH<sub>4</sub></b>	Methane	<b>N<sub>2</sub>O</b>	Nitrous oxide
<b>CHP</b>	Combined heat and power	<b>ODA</b>	Official development assistance
<b>CNG</b>	Compressed natural gas	<b>OECD</b>	Organisation for Economic Cooperation and Development
<b>CO<sub>2</sub></b>	Carbon dioxide	<b>OPEC</b>	Organisation of Petroleum Exporting Countries
<b>COP</b>	Conference of the Parties	<b>PPP</b>	Purchasing Power Parity
<b>COP/MOP</b>	Conference of the Parties to the UNFCCC/ Meeting of the Parties to the Kyoto Protocol	<b>R&amp;D</b>	Research and Development
<b>CRF</b>	Common Reporting Format	<b>ROR</b>	Run-of-River
<b>CTI</b>	Climate Technology Initiative	<b>SCCF</b>	Special Climate Change Fund
<b>DNA</b>	Designated National Authority	<b>SIDS</b>	Small Island Developing States
<b>EJ</b>	Exajoules	<b>SO<sub>2</sub></b>	Sulphur dioxide
<b>ESCO</b>	Energy service companies	<b>SoGE</b>	Seminar of Governmental Experts
<b>ETS</b>	Emissions trading scheme	<b>TRIPs</b>	Trade-Related Aspects of Intellectual Property Rights
<b>EU</b>	European Union	<b>UNDP</b>	United Nations Development Programme
<b>FDI</b>	Foreign direct investment	<b>UNEP</b>	United Nations Environmental Programme
<b>G77</b>	The Group of 77 and China	<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>G8</b>	The Group of Eight	<b>WTO</b>	World Trade Organization
<b>GDP</b>	Gross domestic product		
<b>GEF</b>	Global Environmental Facility		
<b>GHG</b>	Greenhouse gas		
<b>GNI</b>	Gross national income		
<b>HFCs</b>	Hydrofluorocarbons		
<b>IEA</b>	International Energy Agency		

# EXECUTIVE SUMMARY

1. The Institute for Global Environmental Strategies (IGES) conducted a series of stakeholder consultations focussing on the climate regime beyond 2012 in China, India, Indonesia, Japan, the Republic of Korea and Viet Nam, and also at the regional level with cooperation from several organisations across the Asia-Pacific. The aim of these consultations, including national dialogues, questionnaire surveys, interviews with key informants and literature surveys, was to ascertain the concerns, interests and priorities of various countries in relation to the future climate regime.
2. Participating stakeholders (policy-makers, business representatives, NGOs and academia) recognised the progress achieved to date in addressing climate change, especially in creating an international framework through the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol. However, there was widespread concern on the actual progress made in terms of greenhouse gas (GHG) emissions reduction, transfer of technologies, financing and adaptation.
3. There was a broad consensus among the stakeholders, especially in developing countries of the region, that previous discussions on the climate regime were conducted in a non-transparent manner and did not adequately consider Asian interests, concerns, priorities and development needs. Participants emphasised, therefore, that future discussions on the design of the climate regime beyond 2012 should consider such interests and priorities more effectively than before, especially in view of the region's growing influence on energy demands and GHG emissions due to rapid economic and population growth rates.
4. In most countries of the Asia-Pacific, prominence is given to issues associated with poverty alleviation, food security and development; hence climate change is not yet a high priority. Consultations revealed both similarities and differences in the interests and concerns among countries in the region.

Stakeholders in many countries shared similar interests on issues such as:

- (a) the need for considering climate concerns in developmental context;
- (b) streamlining of the Clean Development Mechanism (CDM) by reducing its complexities and uncertainties;
- (c) enhanced focus on adaptation through building on existing funding mechanisms;
- (d) facilitation of the development, deployment and diffusion of climate-friendly technologies; and
- (e) further support for strengthening the capacity of negotiators, the private sector and financial institutions in the region.

However, differences were evident in issues such as:

- (a) ways to consider equity in the future climate regime;
- (b) form, time and kind of involvement of developing countries;
- (c) national preferences for climate-friendly technologies; and
- (d) approaches to, and funding for facilitating adaptation, especially regarding the need for a separate protocol and introduction of market-based mechanisms.



5. Stakeholders in China emphasised that China is primarily concerned about its energy security and is interested in using market-based mechanisms and innovative technologies to address climate change. They acknowledged the need for streamlining the CDM and suggested ways to restructure the intellectual property rights (IPRs) for climate-friendly technologies.
6. Consultations in India revealed that India too, is concerned about its energy security and adaptation, and is interested in utilising the CDM most effectively. The stakeholders expressed a concern on unsustainable lifestyles in developed countries and argued that Annex I countries should make concerted efforts in GHG mitigation.
7. Stakeholders in Indonesia were especially concerned about the difficulties in getting underlying finance for CDM projects, non-inclusion of deforestation avoidance in current CDM, and adaptation. They pointed out that continuity of the Kyoto regime beyond 2012 would be crucial to ensure participation of developing countries in a staged manner.
8. Interviews with Japanese experts showed that Japan is concerned about the difficulties in achieving the tough target for GHG reduction in the current regime and the inadequacy of current policies to meet the target. For the future climate regime, some supported the continuation of the fixed numerical targets, while others advocated more flexible targets.
9. Consultations in the Republic of Korea emphasised the concerns on energy security and possible negative impacts of low carbon development paths on industrial competitiveness. The Korean stakeholders noted the need for introducing flexibility in the design of future climate regime to consider diverse national circumstances of developing countries.
10. Stakeholders in Viet Nam were concerned about harmonizing economic development and GHG mitigation policies, technology transfer and adaptation. They advocated that ways to facilitate the transfer of climate-friendly technologies and strengthen the capacity of policy-makers and other stakeholders should be the basis of future regime discussions.
11. Region-wide consultations with key policy-makers showed that many countries are not benefiting much from the CDM due to poor geographic representation and other barriers. Pacific island countries and least developed countries in the region were concerned about adaptation and argued for a more pragmatic approach for adaptation in the future climate regime.
12. Both creativity and innovation are necessary to adequately reflect the above concerns and interests of the Asia-Pacific in the design of future climate regime. We strongly hope that a blueprint for the future climate regime from an Asian perspective can be developed on the basis of this and the following round of stakeholder consultations in 2006.

## SUGGESTIONS FOR DISCUSSIONS ON CLIMATE REGIME BEYOND 2012 FROM THE ASIA-PACIFIC PERSPECTIVE

1. Future regime discussions should strengthen linkages between development and climate through ensuring that climate change policies contribute to development goals in Asia.
2. Developed countries must take the leadership in reducing GHG emissions by demonstrating that economic and social development can indeed be climate-friendly, and the future regime discussions must focus on designing incentives for climate-friendly initiatives and lifestyles.
3. Involvement of Asian developing countries in the future regime could be very different than that for Annex I countries, and discussions must identify ways to involve them in a progressive and staged manner.
4. Climate regime discussions should soon remove the uncertainties on the continuity of the CDM beyond 2012 and identify ways to enhance efficiency and reduce cost of the CDM approval process through appropriate restructuring without sacrificing environmental integrity. Sustainable development of host countries must be the key focus of the CDM in future regime.
5. In order to facilitate the development, deployment and transfer of climate-friendly technologies in Asia, future regime discussions should give more focus on creating incentives for technology transfer and options for strengthening existing international technology cooperation agreements.
6. Future discussions must create innovative financing options to support GHG mitigation, adaptation, South-South technology transfer, and capacity-building of Asian negotiators.
7. An enhanced focus on adaptation through creating mechanisms, incentives and policies for encouraging both public and private sector investments is crucial to enhance the coping capacity of vulnerable regions and communities in the region.
8. Future regime discussions must deliberate on creating additional means for strengthening human and institutional capacities in the region by building upon the current initiatives of the Convention and the Protocol.

# 1. INTRODUCTION

The chapter discusses the rationale for initiating the consultations on the climate regime beyond 2012, the assessment of the current climate regime and a brief overview of climate regime related challenges in the Asia-Pacific.

*Climate change is a major challenge of the twenty-first century for the Asia-Pacific region, given its high vulnerability due to relatively large/poor populations with low adaptive capacity.*

*Discussions on the future climate regime may include at least four components.*

## 1.1 Rationale for the Consultations

Climate change is a major challenge of the twenty-first century for the entire world, but more so for the Asia-Pacific region, given its high vulnerability due to relatively large/poor populations with low adaptive capacity. Indeed, 90% of global climate-related disasters affected the region and contributed to over a half a million deaths since the 1950s (DFID, 2004). Current evidence thus suggests that the key drivers of both social and economic development are adversely affected by climate change, thereby jeopardising sustainability in the region.

The international community has begun to address the issue of climate change through the United Nations Framework on Convention on Climate Change (UNFCCC) and its Kyoto Protocol. As of 16 September 2005, the Convention has 189 parties while the Protocol has 156 parties. Subsequent to the Russian ratification in November 2004, the Kyoto Protocol finally entered into force on 16 February 2005. As the first commitment period of the Kyoto Protocol runs only up to 2012, it was agreed at the time of enacting the Kyoto Protocol in December 1997 that the global community would initiate negotiations in 2005 on a future climate regime beyond 2012.

The discussions on a future climate regime may include, inter alia, at least four components:

- (a) Deeper and broader efforts of GHG mitigation than are currently prescribed under the Kyoto Protocol, which may be interpreted as further deep emission cuts by Annex I countries, and emission control pledges by major developing countries. It is now widely believed that the Kyoto Protocol is an important first step in global efforts to tackle climate change but its environmental effectiveness is rather marginal, because of (i) the decision to withdraw by major Annex I countries such as the USA and Australia, (ii) the “environmental integrity” issues such as “hot air” and (iii) the absence of linkages with the other environmental and developmental actions.
- (b) New and/or restructured market mechanisms that take into account sustainable development needs of the developing countries.
- (c) Enhanced focus on adaptation, and its mainstreaming in development planning and international assistance.
- (d) More specific agreements on technology development and transfer, financial assistance and capacity building.

The above components have significant implications for sustainable development in the Asia-Pacific region. Many Asian stakeholders, including negotiators, policy-makers, Non-governmental organisations (NGOs) and the private sector perceive that global climate negotiations to date did not effectively consider Asian interests in designing the

architecture for the climate regime. Negotiators from developed countries, on the other hand, contend that negotiators from the region, in general, took a backstage in such discussions. Indeed most developing countries in the region which are mainly preoccupied with their own near-term development needs have largely opted out of the construction of a climate regime. We believe that frank discussions with senior policy-makers and negotiators from the region are a first, crucial step to break this impasse and identify ways to build a more equitable and effective climate regime from an Asian perspective.

## 1.2 Consultation Process

The goal of informal consultation process is two-fold: (a) to promote new and constructive thinking in the Asia-Pacific region on the future actions against climate change beyond 2012, and (b) to contribute to the shaping of a future climate regime that adequately reflects the concerns and developmental aspirations of countries in the region. Specific objectives are listed below:

### 1.2.1 Primary objectives:

- To facilitate discussion on the national concerns, aspirations and priorities for national and regional development in relation to global climate stabilisation goals.
- To discuss progress in current efforts against climate change as a basis for identification of future actions that can protect the global climate system without dangerous impacts on socio-economic systems.
- To assess the view points of key stakeholders on how the future climate regime should evolve based on national circumstances and developmental priorities.
- To define pathways to effectively engage Asia in shaping the future climate regime.

### Secondary objectives:

- To raise the profile of climate change in the development policy of major Asian countries.
- To strengthen the capacity of the key decision-makers in Asia to serve as the leaders of the next phase of the international climate change negotiations.

### 1.2.2 Methodology

The consultation follows a two-round approach, with Round 1 completed in FY (fiscal year) 2005 in time for the presentation of the findings at the COP11/MOP1 (the 11th Conference of Parties to the UNFCCC and the 1st Meeting of the Parties to the Kyoto Protocol). The Round 1 consultations with key policy-makers, academia, NGOs and business representatives were conducted in Republic of Korea (16 June 2005), Indonesia (29 June 2005), India (29 July 2005), China (30 August 2005) and Viet Nam (28 September 2005). In addition, a region-wide consultation was held in Yokohama, Japan on 15 September 2005 in conjunction with the 14th Asia-Pacific Seminar on Climate Change mainly to ascertain the views of representatives of other countries where national dialogues could not be conducted.

*The goal of consultations is to promote new and constructive thinking in the Asia-Pacific region on the future climate regime, and to contribute to the shaping of a future climate regime that adequately reflects concerns and developmental aspirations of the region.*

The Round 2 consultations in FY 2006 are expected to be more extensive than those in Round 1 and will include three segments: (a) A leaders roundtable with key ministers, CEOs, and other senior officials and executives, (b) A larger gathering with a broader group of policymakers, stakeholders, and experts, and (c) An open symposium for the interested public. The participation in first two segments would be by invitation only. As in Round 1, Round 2 would involve a region-wide consultation as well.

The consultations are conducted with the understanding that all the views expressed are informal and in a personal capacity and that the views would not be attributed to any person or organisation in IGES reports. It is also important to note that the "Asia-Pacific region" referred to in this report does not include Australia, New Zealand, and countries in north-west and central Asia.

At each consultation meeting, a framing presentation on the preliminary assessment of the current climate regime was made to provide a basis for the identification of issues to be resolved in discussions on a future climate regime. In this assessment, both achievements and failures of the current regime were highlighted. The following section describes the assessment in brief.

### 1.3 Assessment of the Current Climate Regime

The climate regime's basic principles are enshrined in various articles of the UNFCCC. For example, Article 2 states that greenhouse gases (GHG) must be stabilised at a level that would prevent dangerous human interference with the climate system within an adequate time-frame and that it should allow the adaptation of ecosystems naturally without any threat to food production while ensuring sustainable economic development. Three broad guiding principles include: common but differentiated responsibilities, respective capabilities and equity.

Elements of a climate protection regime include provisions for controlling GHG emissions, managing economic costs and promoting accountability (Baumert and Kete, 2002). From this perspective, the current regime already includes the principles of equity, economics, and sustainable development; form and forum of negotiations; time frame; mitigation commitments; some references to adaptation; and procedures for the implementation and compliance besides commitments by Annex I parties for the transfer of technologies and financial resources to developing countries.

In order to make an objective assessment of the current regime and suggest changes to it, it is important first to look at what it achieved and failed to achieve (Table 1.1).

Insofar as the accomplishments are concerned, the entry into force of the Kyoto Protocol is considered a significant step towards climate change mitigation as it involves targeted emissions reduction pledges by major Annex I countries. The agreement on the Marrakech Accord and the establishment of market-based mechanisms to reduce the cost of the implementation of the Convention and the Kyoto Protocol can be seen as other major achievements. In addition, the need for regular submission of National Communications by both Annex I and non-Annex I parties, which ultimately leads to an increased understanding among the international community, may be considered

*The Kyoto Protocol is considered a significant step to address climate change as it includes the targeted emissions reduction pledges by Annex I parties and the establishment of market-based mechanisms.*

**Table 1.1 Major achievements and weaknesses of the current climate regime process**

Achievements	Weaknesses
<ul style="list-style-type: none"> <li>● Prompt start of negotiations on climate change</li> <li>● Broad participation of countries in the Convention (189 parties)</li> <li>● Entry into force of the Kyoto Protocol</li> <li>● Marrakech accords on market-based mechanisms and adaptation</li> <li>● National Communications</li> <li>● Engagement of the private sector</li> <li>● Engagement of civil society</li> <li>● Increasing attention on adaptation issues</li> <li>● Architecture for the first effective compliance regime</li> <li>● Mechanisms for enabling transfer of technologies and financial flows, and capacity building</li> </ul>	<ul style="list-style-type: none"> <li>● Long international negotiation process and considerable delay in entry into force of the Kyoto Protocol</li> <li>● Weakening of Kyoto Protocol objectives and targets in search for consensus leading to limited environmental effectiveness</li> <li>● Differing positions on global participation (e.g., rejection of the Protocol by major Annex I countries such as USA and Australia, and lack of agreements on national actions)</li> <li>● No major change in emissions growth trends by Annex I countries</li> <li>● Rigidity of top-down, intergovernmental process</li> <li>● Undue focus on assigning blame thereby exacerbating North-South differences</li> <li>● Complexities of market mechanism such as Clean Development Mechanism (CDM)</li> <li>● Failure to link climate change and sustainable development, and the lack of effective mainstreaming options</li> <li>● Inadequate progress in technology transfer, climate finance and capacity building</li> <li>● Inadequate attention to adaptation (as compared with the size and complexity of the issue)</li> <li>● Poor communication to society on effective strategies to tackle climate change</li> </ul>

another major achievement. The design of appropriate mechanisms for the review of the adequacy of commitments, and procedures for the review of the implementation of the Convention are other points of success.

Despite the several accomplishments, there are many weaknesses in the current regime. The current regime is seen as a rigid top-down process involving long, protracted negotiations with each major party aiming to safeguard its short-term interests rather than looking at the long-term goals. The approach itself is highly susceptible to non-cooperation, obstructionism and intransigence from politically and/or economically powerful participants. For example, it took 3 COP (Conference of the Parties) and 8 AGBM (Ad Hoc Group for the Berlin Mandate) sessions to conclude the Kyoto Protocol and it took 7.5 sessions to prepare for the first COP/MOP. There were longstanding disagreements on less important issues, such as preparations of National Communications with reference to their frequency, review process and contents. An extremely complicated decision-making process on the implementation of market-based mechanisms is another weakness. Although a good architecture has been built over time to facilitate technology transfer, financial assistance and capacity building in non-Annex I countries, the current regime is perceived by many as a failure. Insufficient attention to adaptation has also been referred to by many as a weakness in the current regime.

The above weaknesses in the current regime provide a basis for its restructuring or strengthening beyond 2012. It is now believed that several key elements of the Convention and the Kyoto Protocol have been watered down in the interest of building a consensus to reach agreement among the parties. Indeed the interests of both industrialised countries and developing countries often vary considerably. For instance, industrialised countries are more concerned about the cost of compliance and utilising market-based mechanisms for reducing their GHG mitigation costs. They also argue for

*Current climate regime has several weaknesses, which can be the basis for its restructuring or strengthening beyond 2012.*

***Several issues must be resolved to achieve progress in discussions on the future climate regime.***

the participation of major developing countries (aiming at global participation) claiming that GHG emissions in developing countries are soon going to exceed those of Annex I countries. On the other hand, developing countries are more concerned about their development needs and argue that mitigation should be based on the principles of differentiated responsibility and equity. They also demand that Annex I countries must first deliver on their commitments in technology transfer and financial assistance. Most developing countries are interested in utilising the CDM for enhancing their economic development and seeing to it that a future climate regime is more supportive to adaptive capacity of their populations and ecosystems. Of course, the order of priority of issues varies with each country among both developed and developing countries.

In order to make further progress in future regime discussions, we believe that the following issues must be resolved:

- (a) Defining a long term target in quantifiable terms: setting a target either in terms of temperature rise, GHG concentrations or other indicators such as energy intensity, and then defining the necessary actions to be taken to be within the target could help mobilise the policy-makers to take proactive measures.
- (b) Reducing uncertainties on costs and benefits of mitigation and adaptation
- (c) Finding the means so that the USA and Australia, which withdrew from the Kyoto Protocol, could participate more proactively in a future regime than in the current regime.
- (d) Involvement of major developing countries in both mitigation and adaptation efforts while paying due attention to their development rights and aspirations.
- (e) Finding more effective means to involve the private sector and civil society.
- (f) Showing demonstrable progress in mitigation actions by Annex I countries that have ratified the Kyoto Protocol.
- (g) Innovative means for facilitating development and transfer of climate-friendly technologies.
- (h) Increasing the convergence of interests and priorities of industrialised and developing countries.
- (i) Reconciling global strategies with local realities in both Annex I and non-Annex I countries.
- (j) Accelerating vulnerability assessment and adaptation actions as well as technology needs assessment, especially in highly vulnerable countries, such as the LDCs and small island states.
- (k) Reflection of climate concerns in international development assistance programmes, such as the integration of adaptation funding into Official Development Assistance (ODA), or, in other words “continuum of adaptation and development”.

Several suggestions have been given to move forward in the above areas. They include:

- (a) Distributed governance, better communication and engagement of diverse stakeholders.

- (b) Identification of “tipping points” in technology that could bring considerable GHG mitigation benefits.
- (c) Talking beyond numerical targets and including voluntary and contractual measures, especially for large developing countries.
- (d) Designing optional protocols for adaptation, technology transfer, and forestry.

Some people opined that focussing on a limited number of key actors involving both major Annex I and developing countries should accelerate the progress in building a more effective climate regime. Others argued that such a process would be counter-productive as all nations are impacted by climate change and that there should be a means for addressing the concerns of the remaining countries as well.

## 1.4 Climate Regime-related Challenges in the Asia-Pacific Region

### 1.4.1 Outlook for energy demand and GHG emissions in Asia

Energy demand in the Asia-Pacific region is escalating due to the rising population, rapid economic and social transformations characterised by urbanisation, and industrialisation (IPCC 2000, APERC 2002, IEA 2004). IPCC projections show that the global primary energy demand in 2030 would be 895 exajoules (EJ), with Asia accounting for 285 EJ in 2030 in A1 scenario (Figure 1.1). The electricity consumption in Asia, for example, is expected to more than double by 2020, while oil consumption is forecast to rise from 19 million barrels per day (bpd) in 2000 to 35 m bpd by 2020. As for individual countries, China's power consumption rose by 15% in 2003, sharply higher than its 9% economic growth. Projections by the Energy Information Administration (EIA, 2002) indicate that oil demand by China, Japan and Republic of Korea will reach 10.5, 6.4 and 3.0m bpd respectively in 2020. Likewise, the Energy and Resources Institute (TERI) predicts that India's oil demand will rise from 2.1 m bpd in 2004 to 5.6 m bpd in 2030, roughly a fifth of OPEC's current output (Financial Times, July 2004).

While per capita GHG emissions in developing Asia (1-2 tons) are much lower than the world average and 10 to 20 times less than those of the industrialised countries, the total emissions from Asia (which currently account for 20% of the world total) are increasing fast. IPCC projections show that Asia may contribute as much as 3-5 giga tons of CO<sub>2</sub> (as carbon) by 2030 (Figure 1.2). For example, India's GHG emissions are projected to increase from 139 in 2000 to 780 million metric tons of CO<sub>2</sub> (MMt CO<sub>2</sub>) by 2020 (ALGAS, 1998). The use of poor quality fuels such as coal with a high sulphur content, inefficient methods of energy production and use, poor automobile and road conditions, and the increasing use of high-energy transportation methods are also contributing to the rise in GHG emissions from the region.

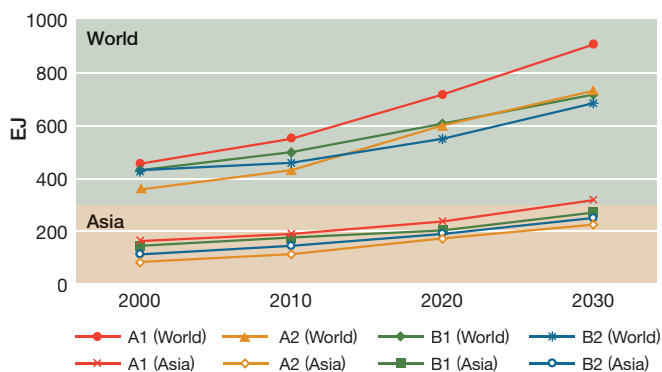
*While per capita GHG emissions in developing Asia are much lower than the world average, the total emissions from the region are increasing fast.*

### 1.4.2 Current status of Asia-Pacific in international climate negotiations

The Asia-Pacific region is not a homogeneous entity with uniformly similar interests on future climate regime. The region has 13 Least Developed Countries (LDCs), several small island states, Organisation for Economic Cooperation and Development (OECD) members (Republic of Korea, Japan), Organisation of Petroleum Exporting Countries (OPEC)

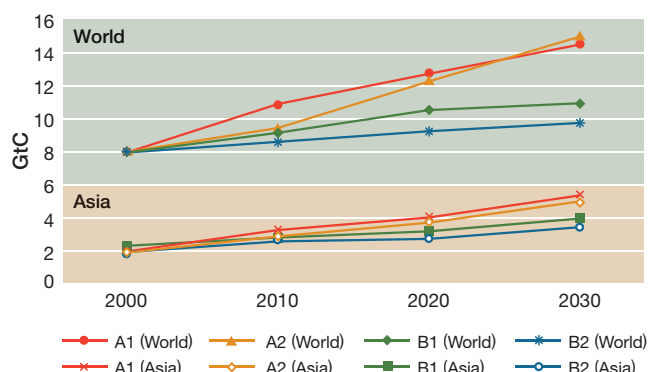


Figure 1.1 Primary energy projections in Asia and the world



Source: IPCC, 2000

Figure 1.2 CO<sub>2</sub> emission projections in Asia and the world



Source: IPCC, 2000

*The interests and concerns of the countries in the region may be similar at time but conflicting and competing on several occasions.*

members and the most populous countries, China and India. The region has only one Annex I country, Japan, with legally-binding emissions reduction targets of the Kyoto Protocol. Therefore, the interests and concerns of these countries may be similar at times but conflicting and competing on several occasions. It is important to draw lessons from both commonalities and differences. In this connection, it is worth bearing that the impacts of climate change too vary with each country (Mendelsohn, 2003).

*Despite its high vulnerability to impacts of climate change and growing GHG emissions, the Asia-Pacific region had a relatively low profile in climate regime discussions to date.*

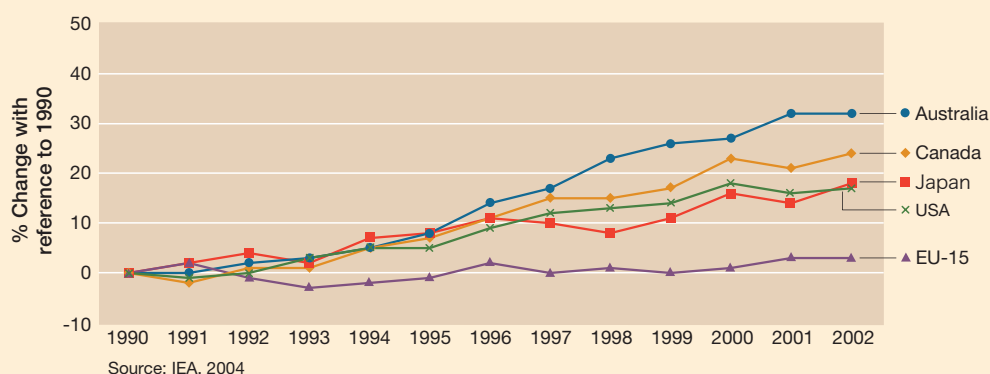
Despite its high vulnerability to the impacts of climate change and growing GHG emissions, the Asia-Pacific region, in general, had a relatively low profile in the climate regime discussions to date as compared with Europe and North America. This is largely related to various factors, among others, listed below:

- (a) Low policy priority to environmental issues in general and climate change in particular in most countries (poverty alleviation, employment, housing, education and health care continue to compete for scarce resources and decision-making), and the insufficient awareness of climate change issues among policy-makers.
- (b) Lack of adequate and reliable projection data and information on local impacts of climate change, and a lack of understanding of the critical role of climate change for achievement of the Millennium Development Goals.
- (c) Uncertainty on ways to distinguish the impacts of natural climate variability and anthropogenic climate change, partly leading to a clear preference for short-term reactive policies of climate-related disaster response and continued hesitation towards long-term proactive climate change policies.
- (d) Uncertainty of costs and benefits of various mitigation and adaptation measures, and consequent absence of willingness to seek co-benefits from GHG mitigation, such as industrial or infrastructural modernisation or efficiency improvement.
- (e) Lack of adequate institutional and human capacity to deal with climate change.
- (f) Insufficient knowledge of ways to transform current energy-intensive economies into climate-friendly societies.
- (g) Lack of clarity on reconciling global challenges such as climate change with local realities.

- (h) Perception among countries that they get little benefit from the current regime negotiations in terms of transfer of technologies, financial assistance and capacity building.
- (i) Lack of development of climate-oriented market mechanisms in certain countries.

Many developing countries in the region have adopted a “wait and see” attitude in climate negotiations to date, as they are yet to see how industrialised countries live up to their past commitments in terms of GHG mitigation and transfer of finances and technologies under the Convention and the Protocol. Indeed, this year is also considered the first round of evaluation for measuring the demonstrable progress. Unfortunately, there is no perceptible decline in overall growth of GHG emissions from major Annex I countries (Figure 1.3). The IEA Energy Outlook for 2004 predicts that the global CO<sub>2</sub> emissions will increase by 63% over the 2002 levels by 2030, and that Annex 1 OECD CO<sub>2</sub> emissions will be 30% above the Kyoto targets by 2010. By 2010, energy-related CO<sub>2</sub> emissions in the European Union (EU) will be 20% above the 2002 level.

Figure 1.3 Trends of CO<sub>2</sub>-eq emissions in major Annex I countries



Moreover, many Asian countries are unsure of how carbon markets will evolve and what the price of CERs will be in the long run, which will be significantly affected by the decisions on the future climate regime. It is also worth noting that discussions on the future climate regime have not reached the Asian societies in general and that no country in the region has yet elucidated its official position on a policy framework for the climate change beyond 2012, although a seminar of governmental experts was recently held in May 2005 to exchange views on this topic.

*No country in the region has yet elucidated its official position on policy framework for climate change beyond 2012.*

In order to make progress on the future climate regime-related discussions, thorough discussion on the above and other challenges is crucial. It is with this perspective we launched policy consultations on the future regime in various countries. The following chapters discuss the national concerns, interests and priorities of various countries individually. A region-wide assessment is then made to identify the commonalities and differences among concerns and interests of various countries.

## 2. CHINA

*Although China ranks the 2nd in the world in terms of the total GHG emissions and energy consumption, its per capita emissions are very low.*

### 2.1 Introduction

The People's Republic of China (PRC) is the world's most populous country with 1.3 billion people (accounting for 20% of the global population) growing annually at 0.6% (World Bank 2005). Its rapid economic growth during the past two decades can be ascertained from the fact that its Gross Domestic Product (GDP) grew by nearly seven times from US\$256.1 billion in 1984 to US\$1,649 billion in 2004 (Table 2.1). Consequently, energy consumption and GHG emissions by China are now the second largest in the world, following the USA (World Resources Institute 2005). Another major reason for the growth

in China's GHG emissions is its high rate of coal use which accounts for 67% of total energy use (UNFCCC 2005g). In terms of per capita GHG emissions, however, China is ranked at 97th and its per capita energy consumption is only one-eleventh of that of the US (Pan 2002a).

Of all GHG, CO<sub>2</sub> emissions are the highest followed by methane. Emissions from energy activities are the highest followed by agriculture (Fig. 2.1). Consumption of energy is projected to increase from 9.8% in 2001 to 14.2% of global consumption in 2025. Likewise, GHG emissions (excluding LULUCF) are projected to grow from 14.7% in 2000 to 17.8% of global emissions in 2025. A recent study by Tsinghua University indicated that GHG emissions are projected to grow to 7039 million metric tonnes of CO<sub>2</sub> equivalent (MMtCO<sub>2</sub>e) in 2030 (Wang et al 2005).

**Table 2.1 Key statistics for China**

Population (2004)	1,297 million	
Annual Population Growth (2004)	0.63%	
GDP (Current US\$) (2004)	US\$ 1,649 billion	
GDP per capita (2004)		
Current US\$ (2004)	US\$1,272	
Purchasing Power Parity (2004)	US\$5,495	
GNI per capita (Atlas Method) (2004)		
Current US\$ (2004)	US\$1,290	
Purchasing Power Parity (PPP) (2004)	US\$5,530	
Annual GDP growth (2004)	9.50%	
Energy demand (2002)	1,229 million metric tonnes of oil equivalent (MMtoe)	
Per capita energy consumption (2002)	959.52 kgoe	
Per capita electricity consumption (2002)	987.09 kWh	
Energy mix (2002)	Coal	57%
	Oil	20%
	Combustible, renewable and waste	18%
	Gas	3%
	Hydro	2%
	Nuclear	1%
GHG Emissions (2000)	4,946 million MtCO <sub>2</sub> e	
GHG Emissions per capita (2000)	3.92 MtCO <sub>2</sub> e	
CO <sub>2</sub> Emissions (2000)	2,790 million MtCO <sub>2</sub>	
CO <sub>2</sub> Emissions per capita (2000)	2.21 MtCO <sub>2</sub>	
CO <sub>2</sub> Emissions per GDP (2000)	2.58 kg/US\$	

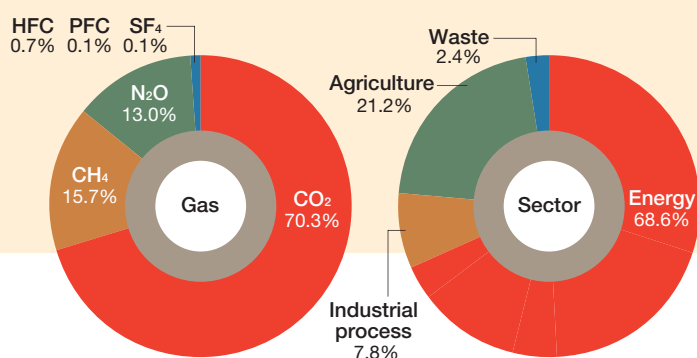
Sources: UNFCCC (2005g), World Bank (2005), IEA (2005)

### 2.2 Major Domestic Climate Policies and International Contributions

In the mid-1980s, China started several GHG mitigation and adaptation initiatives in relation to its national goals for improving energy efficiency, optimising energy structure and conserving energy based on the principle of "developing and conserving energy simultaneously with conservation put in the first place" (UNFCCC 2005g). Some of the policies and measures taken by China are listed below (Table 2.2).

China's contributions to international discussions on the climate regime are articulated through its leadership role within the Group of 77 and China (G77 + China). China's willingness to play an active role in the future regime discussions can be seen from its statements at the Seminar of Government Experts (SoGE) and at the Group of Eight (G8) Gleneagles Summit held this year. In addition, China entered into several bilateral and multilateral partnerships on energy efficiency and conservation with key Annex I countries (e.g., Asia-Pacific Partnership on Clean Development and Climate, and China Climate Change Info-Net).

**Figure 2.1 Distribution of GHG emissions from China in 2000**



Source: WRI-CAIT Version 2 2005

**Table 2.2 Selected climate policies and measures of China**

	Issue	Policies and Measures
M I T I G A T I O N	Energy efficiency	<ul style="list-style-type: none"> <li>• Energy saving and conservation measures through regular 5-year updates to Energy Saving Law of 1985.</li> <li>• National energy conservation plans (1985-2010) include principal policies for energy development and conservation.</li> <li>• Energy transformation: Coal to Natural gas, oil and hydropower, and renewables.</li> <li>• The 9th Five-year Plan (2000-2005) sets goals of improving the energy infrastructure, increasing the share of energy provided by natural gas, and reducing coal use.</li> </ul>
	Renewable energy use promotion	<ul style="list-style-type: none"> <li>• Renewable Energy (RE) Law of 2003 to promote biomass, solar, hydro, wind and geothermal sources with a target of 10% electricity generation from RE. RE use increased by 300% between 1994 and 2000.</li> <li>• National Action Plan on Nuclear Energy Promotion 2004 to achieve a share of 4% in electricity generation by 2025, from less than 1% in 2004.</li> </ul>
	Transportation	<ul style="list-style-type: none"> <li>• Government pledge on investment on transportation sector to achieve annual growth of 7% in energy efficiency.</li> </ul>
	Carbon sequestration	<ul style="list-style-type: none"> <li>• Promotion of the policy of reclaiming farmland back to woodland, large-scale afforestation and reforestation, to enhance the removal of CO<sub>2</sub> by sinks (e.g., "Grain for Timber" project).</li> </ul>
	Technology development and transfer	<ul style="list-style-type: none"> <li>• Key Energy Technology Development Plan of 2005 focusing on critical technologies for GHG mitigation.</li> <li>• Initiatives for enhancing bilateral and multilateral cooperation on climate-friendly technologies, particularly on clean coal technologies.</li> <li>• Initiatives for nuclear technology advancement.</li> </ul>
A D A P T A T I O N	Natural resources management	<ul style="list-style-type: none"> <li>• Policies for food security and forest &amp; biodiversity conservation.</li> <li>• Incentives for water conservation in agriculture and industry.</li> <li>• Converting some of the cultivated land to pasture, forest and grassland.</li> <li>• Plans for co-existence of developmental needs and ecological conservation.</li> </ul>
	Infrastructure management	<ul style="list-style-type: none"> <li>• Strengthening embankments against flooding along major rivers, diverting water from the south to the north.</li> <li>• Improving agricultural infrastructure, and curbing deforestation.</li> <li>• Measures for strengthening the construction of coastal infrastructure against the tide.</li> </ul>
	Other initiatives	<ul style="list-style-type: none"> <li>• Setting up and strengthening the monitoring, forecasting, and early warning systems for control of fire, disease, and pests of pasture and forest.</li> </ul>

Sources: Jiang (2005); UNFCCC (2005g).

## 2.3 Assessment of the Current Climate Regime from the National Perspective

### 2.3.1 Progress achieved-to-date

International consensus about climate change as a global issue and institutional mechanisms to tackle it under the UNFCCC, the Kyoto Protocol (KP) and the Marrakech Accords were regarded as important achievements. The establishment of market-based mechanisms and strengthening of institutional and human capacity-building to address climate change were also recognised as prominent successes of the current regime. Most participants agreed that the KP framework should be the basis for formulating the post-2012 regime.

*The Kyoto Protocol is an important initial step and a good basis for the post-2012 regime.*

### 2.3.2 Global challenges

**2.3.2.1 Compliance challenge:** Participants noted that a stronger compliance mechanism than in the current regime is necessary to improve the credibility of international commitments to reduce GHG emissions. Although the KP has a compliance mechanism, no credible enforcement methods were included in the current framework. This may induce non-compliance by Annex B parties of the KP.

**2.3.2.2 Sustainable development challenge:** Further strengthening of the CDM to promote sustainable development was also identified as a challenge. Current CDM projects approved internationally (and domestically), such as HFC23 and methane projects, are not targeted to sustainable development needs of developing countries.

**2.3.2.3 Technology challenge:** Most participants mentioned that the transfer of climate-friendly technologies from Annex I countries to non-Annex I countries was limited so far, as was confirmed in publications by Chinese researchers (e.g., Jiang 2003, 2005). Facilitating an effective technology transfer remains a key challenge to the global community due to the lack of financing options and barriers related to the protection of intellectual property rights (IPRs).

### 2.3.3 National challenges

**2.3.3.1 High dependence on coal and oil:** As per China's Initial National Communication, two-thirds of China's energy use (67%) is supplied by coal, which when burned releases sulfur and particulates that cause severe air pollution. As of 2005, China ranks the largest coal user in the world, followed by the USA and India. Rising oil demand and imports have made China a significant factor in world oil markets. China also surpassed Japan as the world's second-largest petroleum consumer in 2003. China has become the second largest emitter of GHG after the USA, mainly as a result of fossil fuel combustion. How to minimize GHG emissions while utilizing the currently available fossil fuels in China is a major challenge for both China and the rest of the world.

**2.3.3.2 Adaptation challenge:** China is extremely vulnerable to the negative impacts of climate change. Its large territory and various climatic patterns make China face a difficult situation to adapt to climate change (Table 2.3). Since the early 1990s, studies have been conducted on vulnerability assessment and adaptation in China, focusing on four areas closely related to the economy, namely water resources, agriculture, terrestrial ecosystems, and the coastal zones including offshore marine ecosystems. In terms of geographical distribution, it can be seen that the warming trend was the most obvious in north-west, north-east, and northern China, while not so obvious in the areas south of the Yangzi River. Furthermore, the warming increment in weather is the most obvious effect during the seasonal cycle. Studies on extreme weather events and trends showed that both drought and flooding are likely to become more frequent and intense.

**2.3.3.3 Capacity challenge:** Improving human and institutional capacities to assess vulnerability of, and to develop adaptation strategies to, climate change, and creating well-managed national GHG inventories using the common reporting format (CRF) under the UNFCCC framework, are two major national challenges.

*How to minimize GHG emissions while utilizing the currently available fossil fuels in China is a major challenge for both China and the rest of the world.*

**Table 2.3 Adaptation-related challenges in China**

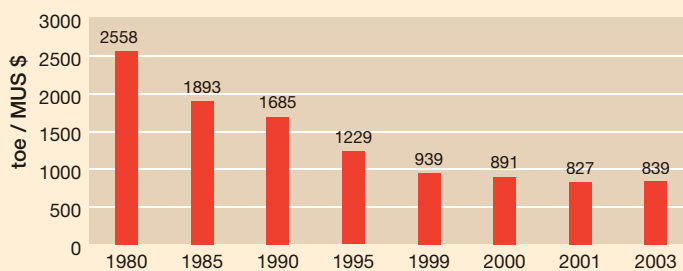
Water resources crisis	<ul style="list-style-type: none"> <li>• Decline in the run-off of the major rivers during the past 40 years.</li> <li>• Continuing drought in the north China since the 1980s.</li> <li>• Frequent flooding disasters in Southern China since the 1990s.</li> </ul>
Glacier melt	<ul style="list-style-type: none"> <li>• Shrinking of glaciers by 21%, especially in west China.</li> <li>• Threatening the future exploitation of the glaciers as water resources.</li> </ul>
Food security	<ul style="list-style-type: none"> <li>• Climate change would speed up plant growth and shorten the crop growth period and consequently would affect the accumulation of dry biomass and the grain yield.</li> <li>• Declines in yield of major cash crops.</li> </ul>
Sea Level Rise	<ul style="list-style-type: none"> <li>• Increasing trend of sea-level rise along the coast since the 1950s.</li> <li>• Current rate of rise of 1.4-2.6mm per year.</li> <li>• By 2100, the rate is estimated to be from 31cm to 65cm, which will cause the serious coastal erosion.</li> <li>• Sea water intrusion into the fresh water, which causes degradation of the quality of water for drinking and farming.</li> </ul>

## 2.4. Major Concerns on Current and Future Climate Regime

### 2.4.1 Development and economic concerns

China's production and consumption of coal, which makes up 67% of its primary energy, is the highest in the world. While China managed to "decouple" the growth of GDP from that of energy consumption recently (Chandler et al 2002), as reflected by considerable improvements in GDP energy intensity (Fig. 2.2) it still faces the crucial challenge of improving its energy efficiency further. With a high rate of economic growth and the rapid increase in energy demands, China is currently concerned with its energy security, as it is predicted that over 60% of China's energy needs will have to be met imports by 2020 (Jiang 2003).

**Figure 2.2 Energy efficiency in China**



Source: Handbook of Energy & Economic Statistics in Japan, 2004.

**Currently over 100 CDM projects are in development in China but only eight projects (four each on methane recovery and renewable energy) were approved.**

#### 2.4.2 Market-based mechanisms-related concerns

Currently over 100 CDM projects are in development in China but only eight projects (four each on methane recovery and renewable energy) were approved with emissions reductions of 1.33MtCO<sub>2</sub> e/yr (Table 2.4)(NCCC 2005). Further, only one out of thirty-four CDM projects registered by the CDM Executive Board (CDM-EB) (as of 1 November 2005) is from China (UNFCCC 2005b). In view of this slow progress, several concerns regarding the CDM were raised by participants and Chinese researchers (Pan 2002b; Zheng 2004). Some of them are listed below:

- Slow development of the CDM market.
- Very few examples of successful CDM projects so far.
- Rigidity of the CDM approval process.
- High transaction costs.
- Lack of confidence among potential participants due to the stagnant CDM market and the non-participation of the US to the Kyoto Protocol.
- Lack of confidence about the validity of the CERs after 2012.
- Low CER price.
- Imbalance between national priorities for development and CDM project areas.

**Table 2.4 List of approved CDM projects by the Chinese government (as of Oct. 25, 2005)**

Project Name	Project Type	Project Owner	CER Buyer	Ave. GHG Reduction (tCO <sub>2</sub> e/y)
Anding Landfill Gas Recovery and Utilization Project	Methane recovery & utilization	Beijing Erqing Environment Engineering Group	Energy Systems International B.V. (ESI)	90,000
Inner Mongolia Huitengxile Wind Farm Project	Renewable energy	Inner Mongolia Long Yuan Wind Power Development Co., Ltd.	SenterNovem (Netherlands)	51,430
Nanjing Tianjinwa Landfill Gas to Electricity Project	Methane recovery & utilization	Nanjing Green Waste Recovery Engineering Co., Ltd.	EcoSecurities Ltd (UK)	265,032
Zhangbei Manjing Wind Farm Project	Renewable energy	Beijing Guotou Energy conservation Company (BJGT)	First Carbon Fund Ltd. (UK)	96,428
Meizhou Landfills Gas Recovery and Utilization as Energy Project	Methane recovery & utilization	Shenzhen PhasCon Technologies Co., Ltd.	Austrian JI/CDM Programme, Kommunalkredit Public Consulting GmbH	278,000
China Xiaogushan Hydropower Project	Renewable energy	Xiaogushan Hydropower Co. Ltd.	World Bank PCF	327,300
Yuzaikou Small Hydropower Project	Renewable energy	Rucheng County Yuzaikou Hydropower Co Ltd.	EcoSecurities Ltd (UK)	40,480
Rudong County Wind Farm Project-China	Renewable energy	Jiangsu Unipower Wind Power Co. Ltd	Cooperatieve Centrale Raiffeisen Boerenleenbank B.A.	181,274

Source: Office of National Coordination Committee on Climate Change (2005)

### 2.4.3 Equity concerns

Although China emits nearly 15% of the world's total GHG emissions in 2000, its per capita GHG emissions are very low (Table 2.1). In addition, despite improvements in its socio-economic conditions, over 200 million Chinese still live on less than US\$1 a day and often do not have access to clean water, arable land, or adequate health and education services (IEA 2002). Most participants were concerned with equity issues, both domestically and internationally, and identified the need for the design of an equitable future climate regime based on common but differentiated principles. Considering such conditions, it was widely felt that it is premature for China to make any legally-binding GHG emissions reduction commitments immediately after 2012 (Jiang 2003b; Pan 2002a).

*Several participants noted that it is premature for China to take any legally-binding GHG emissions reduction commitments immediately after 2012.*

### 2.4.4 Technology development and transfer-related concerns

Most participants pointed out that very few examples of successful transfer of climate-friendly technologies exist and that only two out of sixteen cases examined could be considered successful transfer of technologies from Annex I countries to China. It was also noted that under the Annex I National Communications, "soft" technology transfer, such as information networks and capacity-building, was often listed as transfer of technologies. The poor record of technology transfer so far implied that the use of the market mechanisms was a failure. Participants emphasised that technology transfer from Annex I countries would have to increase exponentially if China is to substantially reduce GHG emissions without compromising its development goals (Pan 2004; Jiang 2005, Jiang 2003b). The long duration of twenty years for the protection of IPRs and the high cost of climate-friendly technologies were considered additional barriers for effective technology transfer (Lesser 2002). The lack of concerted efforts to localise and commercialise indigenous technologies due to limited financial resources was also a point of concern.

*Very few examples of successful transfer of climate-friendly technologies exist so far, which implies a failure of the use of the market-based mechanisms.*

### 2.4.5 Adaptation-related concerns

China is extremely vulnerable to the negative impacts of climate change. China faces a difficult situation in adapting to climate change because of its vast territory and various climatic patterns that affect it. Since the early 1990s, studies have been conducted on vulnerability assessment and adaptation, focussing on four areas closely related to the economy: namely water resources, agriculture, terrestrial ecosystems, and the coastal zones, including offshore marine ecosystems (UNFCCC 2005g). Such studies identified various vulnerable areas, including ecosystems in northern China, but it was found that China lacked adaptive capacity to climate change impacts in terms of human and technical capacity (Pan 2003). Even if the vulnerable areas were identified and appropriate plans set up, financial resources for implementing such plans are limited.

*China faces a difficult situation in adapting to climate change because of its vast territory and various climatic patterns that affect it.*



## 2.5 Priorities for Restructuring Climate Regime

### 2.5.1 Market-based mechanisms

In order to restore confidence in the CDM, participants in our consultations felt that it is necessary to design and implement various policy measures in order to remove uncertainties and minimise risks related to the CDM. Some ways to move forward are listed below:

- Establishment of credit procurement agreements beyond 2012 – unilaterally, bilaterally, and/or multilaterally – to provide investors with confidence in the CDM market and the validity of CERs they purchase now.
- More flexibility should be introduced to the CDM procedures and implementation without compromising environmental effectiveness.
- Unsuitability of unilateral CDM for China due to risks associated with the system (Jahn et al 2003).
- Preference for top-down approach for CDM planning and implementation to bottom-up approach because of the potentials for 1) saving time and centralised monitoring of individual projects; 2) high manageability in multiplying successful CDM project design and implementation and in reallocating benefits from the CDM; and 3) an easier monitoring and evaluation system through the public-private partnerships (Pan 2003; Xu 2005).

*The idea of utilising ODA for CDM is not acceptable to China for several reasons.*

The idea of utilising ODA for the CDM was not acceptable to China because 1) ODA has broader objectives for promoting sustainable development, including the development of social infrastructure; 2) ODA should not be used for commercial activities which create profits for participating companies from developed countries; and, 3) as the Kyoto Protocol and the Marrakech Accords mention, the CDM needs to include the additionality criteria in its project development, which means that the CDM should be additional to what has been and should be done through ODA (Michaelowa et al 2000).

The use of the domestic emissions trading scheme was also mentioned as a future option. In this regard, many participants agreed that the forerunner example of sulphur dioxide Emissions Trading System (SO<sub>2</sub> ETS) case in Hong Kong could surely provide the basis for a CO<sub>2</sub> ETS scheme in the future, including a legal setting, measuring methods, and registration. Moreover, Hong Kong's SO<sub>2</sub> ETS has extended to other provinces based on the 2003 PRD Regional Air Quality Management Plan. The government has already accumulated knowledge and skills on how to cooperate among ministries based on the experience of the collaboration between the Chinese EPA and State Tax Administration of China in implementing SO<sub>2</sub> ETS. Although implementing such a scheme is still a long way off, participants agreed that the ETS could be a good domestic measure for China to make its efforts in reducing GHG emissions and improving its energy efficiency.

### 2.5.2 Technology transfer

Technology transfer-related concerns and expectations were repeated throughout our consultations. The need for new ways of thinking in order to facilitate effective technology transfer was noted. Restructuring the IPR regime for climate-friendly technologies is one of them. Many claimed that the 20-year protection period for patented technologies under TRIPs makes technologies outdated by the time the technologies are transferred

from developed to developing countries (Lesser 2002; Ogonowski et al., 2004). In order to mitigate GHG by relevant technologies, it would be necessary to shorten the IPR protection period for climate-friendly technologies by considering mitigation of the climate change as a global public good. In this respect, the importance of political will was emphasised as in the case of HIV/AIDS drugs, where the patents on drugs for HIV/AIDS treatments are exempted from the Trade-Related Aspects of Intellectual Property Rights (TRIPs) rule in order to enhance the access to drugs (WTO 2001; Lesser 2002; WTO 2003). However, it is also argued that, under market mechanisms, it is important to create a system from which holders of patents could adequately benefit.

Ensuring funding availability and financial safeguards were also argued as important instruments to promote technology transfer. China has its own ESTs, but it claims that sufficient financing is lacking to localise and commercialise such technologies (Peng et al 2005). On the other hand, Annex 1 companies with technologies face pressures from the corporate management to make profits from the technologies in which they have invested enormous amounts of money in their research and development (R&D). In other words, the costs for R&D must be recuperated through the sale of those technologies. In order to fulfill the needs of both sides, the importance of the roles played by the financial institutions – private, multinational, and public seems to be increased.

Conducting mutually-beneficial technology cooperation and demonstration projects for technology transfer is necessary (Jiang 2003b). In this regard, the China-EU cooperation on clean coal technology and the Asia-Pacific Partnership on Clean Development and Climate may serve as good examples in establishing joint R&D on clean technologies.

In combination with financial mechanisms for technology transfer, it is necessary to explore the possibility of an effective technology dissemination mechanism (Jiang 2003ab; Xu 2005). This mechanism should allow substantial decreases in the cost of technology transfer in the larger interests of tackling climate change so that developing countries can have access to affordable yet advanced ESTs.

### **2.5.3 Adaptation**

For China to carry out adaptation policies and measures further, international cooperation in various areas, such as financial mechanism, development and transfer of climate-friendly technologies, and capacity-building, is necessary (Zhou 2005). Several options at the international level were pointed out in our consultations, including an adaptation protocol, capacity-building, funding mechanism, and transnational networking of technology and knowledge for adaptation.

Participants noted that increasing the current 2% share of the proceeds from the CDM projects to the Adaptation Fund is not likely to be adequate to respond to the adaptation needs expressed by developing countries. It was argued that guidelines on utilising the adaptation fund should be made at the international arena. The idea of introducing market mechanisms in adaptation through adaptation vouchers or credits was discussed. Many participants who expressed their concern on the complexity of the market mechanisms doubted its practicality. Although the idea of using the insurance mechanism for adaptation seems to be attractive to developing countries that are extremely vulnerable to climate change impacts, participants expressed that total

***Restructuring of the IPR regime for climate protection technologies through shortening the duration of IPR protection may facilitate technology transfer to developing countries.***

***For China to carry out adaptation policies and measures further, international cooperation in various areas, such as financial mechanism, development and transfer of climate-friendly technologies, and capacity-building, is necessary.***

reliance would not be appropriate because private insurance markets were still immature in developing countries, including China (China Economic Information Network 2003).

#### 2.5.4 Equity

*The principle of “common but differentiated responsibilities” should continue be the basis of the future regime.*

All participants shared the view that the principle of “common but differentiated responsibilities” should be maintained in the future regime. However, the difficulties in forging and implementing a universal equity principle, which would cover all the parties to the UNFCCC, the KP, and an upcoming regime after 2012, were considered a challenge (Pan 2002a). For example, it was noted that while the per capita allocation principle may be preferable to those countries with high population growth, such as China and India, emission intensity per GDP may be preferable to those with low population growth, like Japan and other Annex I countries.

As one of the forms for allocation, the idea of “grandsoning” principle, which allocates emissions caps according to future projections of emissions instead of the grandfathering principle, was introduced. The idea was welcomed but its feasibility and practicality were questionable due to various uncertainties in climate science that makes future predictions of GHG emissions. It was agreed that principles and methods that the parties can accept and recognise as fair should be explored further in order to attract wider participation of the parties in a future climate regime. In this connection, Pan (2003) proposed three forms for commitments in a future climate regime, namely voluntary, conditional, and obligatory, which allow countries not to sacrifice their development goals (Table 2.5). Such distinction could form the basis for discussions on equity in the future climate regime.

**Table 2.5 Potential forms of commitments for the future climate regime**

Form	Contents	Expected goals
Voluntary	<ul style="list-style-type: none"> <li>• No-regret emissions reductions.</li> <li>• Autonomous energy efficiency improvement during the course of economic development.</li> <li>• No technological progress and institutional innovation.</li> <li>• Voluntary adjustments to more energy and carbon saving way of life (lifestyle changes).</li> </ul>	<ul style="list-style-type: none"> <li>• Internal drive to increase energy efficiency &amp; lower costs of production and consumption.</li> <li>• Technology spill-over effect.</li> <li>• Developed countries’ commitment is obligatory due to technological advantages.</li> </ul>
Conditional	<ul style="list-style-type: none"> <li>• External push (technology transfer and financial assistance) is needed.</li> <li>• Emissions reductions and human development.</li> <li>• No luxurious/wasteful emissions in developing countries.</li> <li>• No carbon credits granted if no-achievement in human development.</li> </ul>	3 purposes (simultaneously): <ul style="list-style-type: none"> <li>• extra emissions reduction,</li> <li>• lower costs of emissions in developed countries,</li> <li>• Achievement of development goals in developing countries.</li> </ul>
Obligatory	<ul style="list-style-type: none"> <li>• “Rights” for basic human needs.</li> <li>• Restriction of excessive emissions.</li> <li>• No distinctions among countries in terms of “rights.”</li> </ul>	<ul style="list-style-type: none"> <li>• No excessive emissions or restrictions on lifestyles are allowed.</li> </ul>

### 2.5.5 Capacity-building

Participants noted the need for enhancing capacity in several areas as follows: development of GHG inventories; statistical data management using the UNFCCC Common Reporting Format (CRF); procedures for handling data on impacts & the response measures; market-based mechanisms; project management, carbon accounting, and fund allocation to projects and technology localisation (Pan 2003; Jiang 2003ab). To realise this, participants urged for more international assistance in terms of funds and technological support.

### 2.5.6 Other issues: Compliance

In designing a stronger compliance mechanism of the future climate regime, some participants suggested that the compliance mechanism under the Montreal Protocol could be a good model. It was noted that lessons from successful cases of compliance should form the basis for discussions on future regime by furthering synergies among not only the Rio Conventions, but also other multilateral environmental agreements (MEAs) including the Montreal Protocol.

*The compliance mechanism under the Montreal Protocol may be a good model for designing a stronger compliance mechanism of the future climate regime.*

## 2.6 Epilogue

China's major concerns for the current and the future climate regime are energy security, technology transfer and the market mechanisms. Therefore, Chinese policy-makers and negotiators need to play proactive roles in mainstreaming these concerns and issues into the China's national development strategies and implementation (Papineau 2005). In terms of energy security concerns, China should reflect its concerns into the design of CDM projects that contribute to the improvement of its energy efficiency. Regarding technology development, deployment and transfer, China should broaden the partnerships with developed countries as well as mobilise domestic financial resources in order to help localise/ commercialise technologies that already exist in China. In this regard, examples under the other conventions, particularly the Montreal Protocol and its multilateral fund, should be incorporated into the plan for future climate policies (Pan 2003).

In designing the future climate regime, it is necessary to create a situation that would change the game from "blaming" to "cooperation". Considering the fast growing trends in its economy, energy consumption, GHG emissions, China will undoubtedly become a major actor in discussions on the future regime. China's active participation in international negotiations and its political will to implement concrete domestic measures will ultimately determine the future of China and the world.

*In designing the future climate regime, it is necessary to create a situation which would change the game from "blaming" to "cooperation".*

# 3. INDIA

## 3.1 Introduction

*Although India is ranked fifth in total GHG emissions, its emissions per capita still remain low - 1/5 of the world average.*

India, being the world's second most populous country with a burgeoning middle- and high-income population with increasingly energy-intensive lifestyles, has strong influence on global energy consumption and thereby GHG emissions. For example, the relatively rapid economic and energy growth rates since the 1990s (6-7% per year) led to a surge in electric power demand (8% per year). However, India is also the home to more than 250 million people living on less than US\$1 per day and about 550 million people without access to electricity. India occupies 2.4% of the world's geographical area, supports nearly 17% of its population, and emits less than 5% (4.4% in 1998) of GHG emissions (Table 3.1). GHG emissions per capita in India are thus very low (a fifth of the

world average), around 1.3 tons CO<sub>2</sub> equivalent as against 20-30 tons in developed countries. Despite such low per capita emissions, India ranks fifth in total emissions after the USA, China, Russia and Japan.

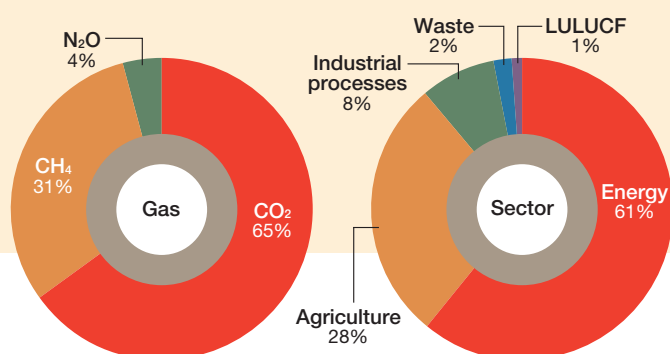
Of all GHG, CO<sub>2</sub> emissions were the largest and the energy sector contributed most (Fig. 3.1). After increasing steadily for at least two decades, India's energy, power, and carbon intensities began to decline rapidly after 1995, due to factors such as increased share of service sector in the GDP, and energy efficiency improvements. This shift suggests the start of a decoupling of the energy and economic growth, as has historically occurred in industrialised countries at higher per capita income levels (Chandler et al., 2002). Assuming sustained economic growth and continued dependence on domestic coal reserves, Business-as-usual (BAU) projections suggest a rapid rise in GHG emissions, with the energy- and forestry-related carbon emissions amounting to at least 688 and 29 million tons respectively in 2030 (ALGAS, 1998). Another study projected that carbon emissions would increase by 2.9% from 2001 annually to reach 500 million metric tons of carbon (1,834 MMt CO<sub>2</sub>) in 2025 (McKibbin, 2004). Even with such increases, projections by 10 models suggest that India's GHG emissions would largely be within the range of 6-8% of global emissions even in 2100 (Weyant, 2004).

**Table 3.1 Key statistics for India**

Population (2004)	1,079 million
Annual Population Growth (2004)	1.43%
GDP (Current US\$) (2004)	US\$ 691.9 billion
GDP per capita (2004)	
Current US\$ (2004)	US\$641
Purchasing Power Parity (2004)	US\$3,115
GNI per capita (Atlas Method) (2004)	
Current US\$ (2004)	US\$620
Purchasing Power Parity (2004)	US\$3,100
Annual GDP growth (2004)	6.90%
Energy demand (2002)	538 million Mtoe
Per capita energy consumption (2002)	513.34 kgoe
Per capita electricity consumption (2002)	379.78 kWh
Energy mix (2002)	
Fossil Fuel	65%
Traditional biomass	32%
Other renewable sources	2%
Nuclear energy	1%
GHG Emissions (1994)	1,229 million MtCO <sub>2e</sub>
GHG Emissions per capita (1994)	1.30 MtCO <sub>2e</sub>
CO <sub>2</sub> Emissions (2000)	1,071 million MtCO <sub>2</sub>
CO <sub>2</sub> Emissions per capita (2000)	1.05 MtCO <sub>2</sub>
CO <sub>2</sub> Emissions per GDP (2000)	2.34 kg/US\$

Sources: UNFCCC (2005g), World Bank (2005), IEA (2005)

**Figure 3.1 Distribution of GHG emissions from India in 1994**



Source: UNFCCC, 2005g

## 3.2 Major Climate Policies and Contributions to International Discussions

Being a developing country, India has no obligations to reduce GHG emissions under the UNFCCC. However, India initiated a number of policies and measures for the mitigation of and adaptation to climate change (Table 3.2). In 2000 alone, energy policies reduced carbon emissions growth by 18 MMt—about 6% of India's gross energy-related carbon emissions. However, because Indian industry is still highly energy-intensive compared to developed countries, there is considerable room for improvement (Chandler et al., 2002).

**Table 3.2 Selected GHG mitigation and adaptation policies and measures in India**

	Area	Policies and Measures	Remarks
M I T I G A T I O N	Energy efficiency improvement and energy conservation	<ul style="list-style-type: none"> <li>● Gradual removal of energy subsidies, regulatory restructuring, privatisation and unbundling of state-owned utilities.</li> <li>● Promotion of efficient use of coal through pricing reforms and technology up-gradation including coal-washing, combustion technology and recovery of coal-bed methane.</li> <li>● Increase in fuel efficiency and conservation in oil sector through reduction of gas-flaring, installation of waste heat-recovery systems, energy audits, equipment up-gradation, substitution of diesel with natural gas and development of fuel-efficient equipment.</li> <li>● Promotion of fuel-efficient practices and equipment, replacement of old and inefficient boilers, and other oil-operated equipment, fuel switching and technology up-gradation.</li> <li>● Import of foreign cars and appliances which generally are more energy-efficient than those they replace.</li> <li>● Energy Conservation Act (2001), Electricity Act (2003) and the establishment of the Bureau of Energy Efficiency helped in taking conservation measures, such as energy standards, labelling of equipment/appliances, energy codes for buildings and energy audits.</li> </ul>	A 370% rise in the price of coal between 1980 and 1995 reduced demand for coal.
	Promotion of renewable energy	<ul style="list-style-type: none"> <li>● Creation in 1992 of a separate Ministry of Non-Conventional Energy Sources, strong R&amp;D programmes and shift from purely subsidy-driven dissemination programmes to technology promotion through the commercial route.</li> <li>● Setting a goal of using renewable energy for 10% of new power generating capacity by 2010.</li> <li>● A national hydropower initiative targeted at the setting up of an additional 50,000 MW of hydropower by 2012, of which 50% would be from Run-of-River (ROR) projects without large reservoir capacities.</li> <li>● Improving the efficiency of wood stoves in 34 million homes reduced deforestation in several areas.</li> <li>● Installation of 7,760 MW of hydropower; 3,000 MW of wind power; small and micro hydro plants of 1,600 MW; and 600 MW of biomass-based power; Additional 41 schemes of 15,300 MW power are in different stages of implementation.</li> </ul>	Over 3.5% of grid capacity is based on renewable energy; Enhanced renewable energy focus led to installation of 3.26 million biogas plants, 34.3 million improved wood burning stoves, 350,000 solar lanterns, 177,000 home lights, 41,400 street lighting systems and 4200 solar pumping systems;
	Transportation	<ul style="list-style-type: none"> <li>● Reduction of vehicular air pollution (e.g., In Delhi, 84,000 public vehicles—all buses, taxis, and three-wheelers—were converted from gasoline and diesel to Compressed natural gas (CNG)) - initiative to be expanded in many other towns and cities in a time-bound manner.</li> <li>● Introduction of emission standards (Bharat Stage II) for motor cars and passenger vehicles in Delhi on 1 April 2000 and extension to other metropolitan cities.</li> <li>● Use of bio-diesel: The blending of ethanol in petrol and diesel is to be gradually increased to 10%.</li> </ul>	
	Carbon sequestration	<ul style="list-style-type: none"> <li>● Afforestation policy (Between 1990 and 1999, over 14 million hectares were brought under afforestation). The increase the forest and tree cover in the country is planned to be increased from existing 23 per cent to 25 per cent by 2007 and 33 per cent by 2012.</li> <li>● Checking diversion of forest land to non-forestry purposes.</li> </ul>	The per capita rate of deforestation in India is among the lowest in developing countries.
	Technology initiatives	<ul style="list-style-type: none"> <li>● Coal gasification, beneficiation and liquefaction for value addition to domestic coal, and recovery of coal bed methane; Reduced gas flaring; Improved household stoves.</li> </ul>	
	Other initiatives	<ul style="list-style-type: none"> <li>● Introduction of market-based pricing for both power and liquid fuels replacing the administered-price system.</li> <li>● Standardisation of fuel-efficient pump sets, rectification of existing ones and rationalisation of power tariffs in agriculture sector.</li> </ul>	
A D A P T A T I O N	Natural resources management	<ul style="list-style-type: none"> <li>● Agricultural policies for promoting integrated watershed management, and resource conservation technologies such as zero tillage and rainwater harvesting.</li> <li>● Forestry policies: Afforestation and wasteland development policy, Conservation reserve strategy, Joint forest management.</li> <li>● Identification of 30 mangroves and 4 coral reefs for conservation and management.</li> </ul>	
	Infrastructure management	<ul style="list-style-type: none"> <li>● Preparation of coastal zone management plans.</li> </ul>	
	Other initiatives	<ul style="list-style-type: none"> <li>● Established a climate change cell in Ministry of Agriculture for mainstreaming climate change concerns in agricultural programmes and policies.</li> </ul>	

Sources: Parikh and Parikh (2002), Chandler et al. (2002), UNFCCC (2005g)

*While India does not face any obligations of emissions reduction under the UNFCCC and the Kyoto Protocol, India has been actively committed to international efforts to mitigate climate change.*

India signed the UNFCCC on 10 June 1992 and ratified it on 1 Nov. 1993. It acceded to the Kyoto Protocol on 26 August 2002 and hosted COP8 in October 2002, when the “Delhi Declaration on Climate Change and Sustainable Development” was adopted to provide an impetus to global discussions on adaptation later on. It submitted the first National Communication in 2004. While there has been some apprehension on India’s participation in the recently announced (28 July 2005) Asia-Pacific Partnership on Clean Development and Climate, many participants maintained that India is committed to the international regime represented by the UNFCCC and its Kyoto Protocol. India’s extensive experience with Activities Implemented Jointly (AIJ) and Global Environmental Facility (GEF) projects helped the country to take a proactive role in initiating CDM projects. Insofar as scientific research is concerned, Indian scientists played a key role in international efforts, such as the World Climate Programme, Global Observing System, and the International Geosphere-Biosphere Programme.

### **3.3 Assessment of the Current Climate Regime from the Indian Perspective**

#### **3.3.1 Progress to date**

Participants noted that progress was substantial in formulating guidelines and institutional setting, but dismal in actual implementation, especially with regard to progress in GHG emission reductions by Annex I countries, and in the transfer of technologies and financial assistance to developing countries. The Kyoto Protocol is considered a small but significant step in the right direction to mitigate climate change. Institutionalisation of market-based mechanisms such as the CDM was also seen positively.

#### **3.3.2 Global challenges**

**3.3.2.1 Trust building challenge:** In order to restore trust between developed and developing countries and ensure stabilisation of the climate, it was noted that Annex I countries should fulfil their GHG emissions reduction commitments under the Kyoto Protocol and that Annex I countries which have not ratified the Kyoto Protocol should make meaningful domestic policies. Some participants noted that it is nearly impossible to persuade India to control the growth of emissions if Annex I countries fail to achieve their emissions reduction commitments. Several participants expressed frustration that some industrialised countries have not initiated any substantive action to fulfil the promises of returning to their 1990 levels of emissions by 2012. For instance, the increase in GHG emissions of developed countries during the 1990s was nearly as much as India’s total emissions. IEA projections indicate that the aggregate CO<sub>2</sub> emissions of developed countries will continue to increase over the next three decades, despite their obligations under the UNFCCC and the Kyoto Protocol (IEA, 2004).

**3.3.2.2 Compliance challenge:** Some participants raised the issue of compliance as a challenge, as they felt that current regime does not specify clearly if and how penalties for non-compliance will be enforced by the end of the first commitment period.

**3.3.2.3 Communication challenge:** Communicating the right information to civil society so that all sections can participate proactively is considered a major challenge. It was noted that in democratic societies like India, it is often difficult to persuade the public to bear short-term costs or inconveniences in pursuit of achieving long-term benefits

*Some participants noted that it is nearly impossible to persuade India to control the growth of emissions if Annex I countries fail to achieve their emissions reduction commitments.*

such as GHG mitigation. It is important, therefore, to raise public awareness and understanding of the co-benefits of climate policies. While agreeing with the importance of raising awareness, some participants noted that we should be cautious not to sensationalise climate information which may mislead the public. Capturing the attention of political leaders and creating conditions that prompt the development of leadership are considered paramount.

**3.3.2.4 Technology challenge:** Development and deployment of climate-friendly technologies are considered a major challenge as very few examples of successful transfer of technologies to developing countries were reported in the Annex I National Communications.

Maintaining the spirit of Kyoto in the future regime discussions by turning the problems of climate change into opportunities, and building a road map by defining deliverables at each step of implementation of the climate regime are two other challenges.

### 3.3.3 National Challenges

**3.3.3.1 High dependence on coal and fuel wood:** Endowed with large coal reserves (estimated to be 234 billion tonnes in 2002), India has an energy system that is highly carbon intensive. India's dependence on coal, which meets 52% of its commercial energy needs, is likely to continue in the near future. India's coal production grew to more than 328 million tonnes in 2001/02 making the country the third-largest producer after China and the USA. How to utilise this natural resource in a sustainable manner without increasing emissions considerably remains a major challenge. In addition, large quantities of traditional biomass resources consumed for the energy needs of the vast rural population are exerting pressures on forests and village woodlots. Here again, how to meet energy needs without significant rises in GHG emissions remains a major challenge.

**3.3.3.2 Adaptation challenge:** India is strongly concerned about the adaptation to climate change because its economy is heavily reliant on climate-sensitive sectors. As 65% of Indian agriculture is dependent on rainfall, any adverse impacts on water availability due to glacier retreat, decreased rainfall and increased flooding in certain pockets would threaten food security. Sinha and Swaminathan (1991) estimated that a 2°C increase in mean air temperature could decrease rice yield by about 0.75 ton/hectare. Kumar and Parikh (2001) reported that a 2°C rise temperature and an accompanying precipitation change of +7% could reduce farm level net revenue by 9%. Climate change can exacerbate the drought impacts in 150 of the country's poorest districts, where it is a perennial feature. In the absence of protection, a 1-metre sea level rise could displace 7 million people and submerge 500,000 hectares of land (UNFCCC, 2005g). How to improve the adaptive capacity of both the people and the ecosystems is thus a big challenge.

**3.3.3.3 Capacity challenge:** Improving human and institutional capacity to assess costs and benefits of, and to develop adaptation strategies to, climate change is a challenge.

*Due to its high dependence on coal and fuel wood, India faces difficulties in finding ways to utilize natural resources in a sustainable manner without increasing carbon emissions considerably.*

## 3.4 Major Concerns on Current and Future Climate Regime

### 3.4.1 Developmental and economic concerns

The United Nations Development Programme (UNDP) ranks India at a level of "medium human development," ranking 127 on the list of 183 countries (UNDP, 2005a). The overriding priorities of India, therefore, are economic development (with a target GDP



growth rate of 8% and the doubling of the per capita income by 2012), poverty alleviation (to achieve 10% reduction by 2012) and provision of basic human needs to its population. Achieving these priorities will require a substantial increase in energy consumption, both at the macro and the micro levels, and consequent rise in GHG emissions. Addressing global issues such as climate change while continuing to develop is a major concern in India.

***India is strongly concerned about energy security, as it faces serious energy shortages.***

India is strongly concerned about energy security, as it faces serious energy shortages. India is highly dependent on coal, and it has just 0.8% of the world's known oil and natural gas resources. The World Energy Outlook projects that India's dependence on oil imports will grow to 91.6% by the year 2020 (IEA, 2004). A few participants noted that the current high fuel prices in terms of PPP are serving as an automatic check for reducing emissions in India. Assuming an energy growth rate of 5% per annum, the demand from power sector will increase from 120,000 MW to about 400,000 MW in 2030. At that time, the power generated from coal-based power plants would increase from the existing 67,000 MW to 200,000 MW, which in turn would demand significant build-up of thermal power plants and large scale expansion of coal fields with significant implications for GHG emissions. How to produce energy from the coal sector with minimum GHG emissions is, therefore, a major concern.

Although India made considerable efforts in promoting renewable energy, the impact to date is still low as these technologies are still costly. The latest national energy outlook predicted that it would be difficult for renewable energy to exceed 3% of the total energy supply. Concern on ways to make these renewable energy technologies affordable to Indian society was expressed.

***Indian policy makers asserted that it is premature for India to take any legally-binding GHG emissions reduction commitments.***

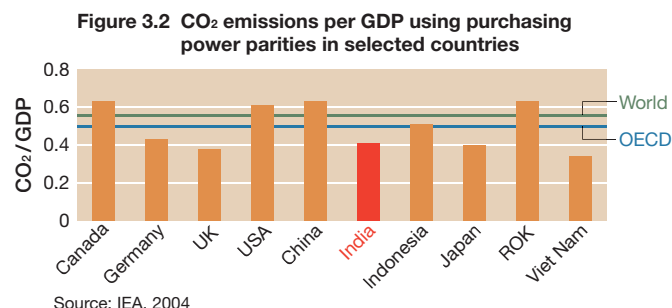
The concerns on India's energy security led to a discussion on its stance on mitigation commitments. Some participants argued against the relevance of such terms as "large developing countries" and "key emitters" in considering the future GHG emission reduction commitments, and noted that indirect "pressure" from Annex I countries was totally unjustified and would not positively contribute to the discussions on the future regime. They mentioned that "cap and trade" emission trading is not necessarily appropriate for countries like India in the future regime. Murthy et al. (2000), for example, reported that a 30% CO<sub>2</sub> reduction over a period of 30 years can lead to a fall in the GDP by 4% and an increase in the number of poor by 17.5% in the 30th year. Kallbekken and Westskog (2003) reported that the efficiency gains obtained by participating in emissions trading cannot offset the economic risks incurred by taking on binding commitments. Others insisted that developed countries should first fulfil their own commitments before requiring developing countries to take such commitments.

### **3.4.2 Equity-related concerns**

Many participants noted that global warming was largely due to the industrial revolution and the use of fossil fuels by developed countries for the attainment of their current levels of prosperity, and that developing countries, such as India, have not significantly contributed to the problem, although the latter would be the most affected due to its low adaptive capacity. As India emits less than 5% of the world's GHG emissions but has 17% of its population, and currently 57% of its population do not have access to electricity (IEA, 2004), several participants felt that it is premature for India to take any legally-

binding GHG emissions reduction commitments. However, some participants argued for India making realistic progress in reducing its emissions growth trends so that it could be a positive signal to global community.

A concern was its raised regarding the criticism from Annex I countries that India is not doing enough in the GHG mitigation efforts. Some participants noted that such criticism is both unwarranted and unfair, as the CO<sub>2</sub> intensity of GDP at PPP in India is much lower than that of OECD and world averages and some developed countries (Fig. 3.2).



### 3.4.3 Market mechanisms-related concerns

Participants noted a rapid shift in perceptions of the Indian policy-makers and industry leaders regarding the CDM from being overly pessimistic to overly optimistic. India is now a leading country in the CDM, as more than 100 projects worth more than US\$ 2 billion were approved and more are in the pipeline to be approved by the national CDM authority. However, participants expressed concern that only seven out of 107 projects were registered by the CDM Executive Board as of 1 November 2005 and that most projects developed to date (91 out of 107) are unilateral. Of the seven projects approved by the CDM EB, three are unilateral (UNFCCC, 2005b). Therefore, some considered that the spirit of the Kyoto Protocol was not maintained.

A few participants cautioned against unrealistic expectations on the CDM in relation to financial and technological transfers and reminded that the CDM would at best meet only 4-15% of the gap in the world's demand for CER, which translates to 275 to 885 MTCO<sub>2</sub> eq. per year. They noted that the real concern was to examine how far developed countries would indeed be forthcoming in relation to the apportionment of the cost of emission moderation measures taken in developing countries. Several concerns were raised on the slow and complex CDM approval process which were similar to those noted in the national strategy study on the CDM implementation (TERI, 2005).

Some participants expressed concerns that the CDM did not significantly improve the transfer of technologies or finance as originally envisioned at the time of formulating the CDM. Others were concerned about the high transaction costs due to the extremely complex procedures of the CDM approval and implementation process, long lead times, low price of CERs, and reduced demand for CER, especially due to the withdrawal of the USA from the Kyoto Protocol and the existence of Russian and East European "hot air". Concern was also raised on the relatively low share of CDM projects with sustainable development benefits as against a large share of projects, such as landfill methane recovery, and decomposition of hydrofluorocarbon (HFC) and nitrous oxide (N<sub>2</sub>O). Some participants raised concern that there is a very limited CDM market, especially for small-scale projects. Many participants strongly argued against utilising current ODA for CDM. A few participants noted the need for an organised inquiry on why the CDM did not fulfil expectations on sustainable development and technology transfer.

***The CDM did not significantly improve transfer of technologies and finances as originally envisioned at the time of its formulation.***

Some experts argued, however, that India is in the process of learning market-based mechanisms and that it should get as much benefit from the CDM as possible while following the rules of the game precisely. Major opportunities include demand- and

supply-side efficiency measures, fuel switching from coal to gas, afforestation, and power transmission improvements. Over the next decade, 120 million tons of carbon mitigation could be achieved at a cost of \$0-15 per ton avoided (Chandler et al., 2002).

#### **3.4.4 Technology development and transfer-related concerns**

Participants noted that very few examples of successful transfer of technologies were reported in Annex I National communications, and that information networks and capacity-building were often included under technology transfer. It was noted that critical technologies which can have significant impact on de-carbonisation have been out of reach of developing countries because of both prohibitive costs and the existing IPR regime. India has a coal-based energy structure and is expected to predominately use coal in its energy mix over the next 100 years, hence clean coal technologies and the production of energy through integrated gasification and combined cycle (IGCC) route are very important. Although the promotion of renewable energy is one pillar of Indian mitigation policies, renewable energy has limitations in terms of technology and cost. These observations led to an argument that technology development and transfer relating to clean coal technologies and renewable energy technologies were critical for India's mitigation efforts.

A concern regarding limited cooperation on nuclear energy among developed and developing countries was also raised. As the current regime does not adequately address development and transfer of climate-friendly technologies, some participants opined that pacts, such as the Asia-Pacific Partnership on Clean Energy and Development which aims to cover a broad range of technologies (energy efficiency, clean coal, IGCC, Carbon Capture and Storage (CCS), Combined Heat and Power (CHP), civil and nuclear energies, etc.) would be useful.

#### **3.4.5 Adaptation-related concerns**

India is highly vulnerable to the impacts of climate change, hence adaptation is a crucial issue. The majority of the Indian population (agricultural, coastal fishing and forest-dwelling communities) is susceptible to shifts in weather systems and ecosystems resulting from climate change. Diminishing water resources due to changing climate was another point of concern. Despite such extreme vulnerability, research on the vulnerability of India is very limited, and the few existing analyses focus almost exclusively on coastal zones and agriculture. A concern was raised with regard to the lack of focus on impacts and uncertainty in predictions of local and sub-national impacts. Some participants emphasised that adaptation strategies should be based on the sound science of vulnerability assessment and raised a concern that very few examples of impacts of climate change from Asia in general, and India in particular, are available in IPCC reports to date.

Strong concerns were expressed regarding weak institutional mechanisms, inadequate financial resources, the lack of research on adaptation issues, and the failure to integrate adaptation concerns in development planning in India. Participants noted, for example, that water resource development plans for the next 50 years do not discuss the impacts of climate change at all, although it is well-known that climate change is already adversely

***The lack of strong institutional mechanisms, financial resources and human capacity to assess vulnerability and impacts are barriers for taking effective measures for adaptation to climate change.***

influencing monsoons, water flow in rivers, and groundwater recharge.

Concerns were raised regarding how adaptation is addressed under the current climate regime. Some participants noted that the current regime is not robust enough to address adaptation as funding for adaptation is extremely limited and most GEF funds for climate change were directed to mitigation rather than adaptation. Participants voiced serious concerns on the complex procedures for accessing GEF funds with regard to their requirements to demonstrate “global benefits” and compute “incremental costs”. Participants noted that too many focus areas were placed under the jurisdiction of GEF over time, thereby reducing GEF focus on adaptation. Concern was also expressed on lack of clear guidance to GEF from COP regarding utilisation of adaptation funds.

The 2% share of CDM proceeds for the Adaptation Fund were regarded inadequate to meet adaptation needs. It was noted that traditional technologies and indigenous knowledge on adaptation could be useful, but the future focus for the climate regime should be on funding for the development and transfer of new technologies for adaptation. Some participants welcomed that ODA should facilitate adaptation measures, but some objected to the idea of linking ODA and adaptation and argued that ODA for adaptation should be additional. A concern was raised that despite its importance, international support for capacity-building on adaptation issues was limited. The need for public-private partnerships in facilitating adaptation was emphasised. However, some participants noted that incentives for private sector are not yet appealing for them to be involved in adaptation.

### 3.4.6 Financing-related concerns

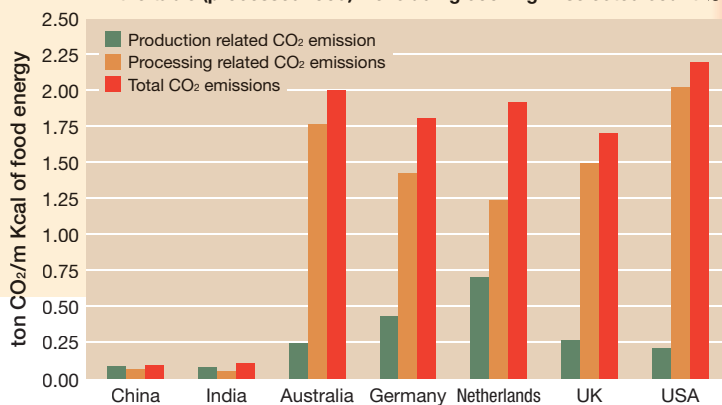
A concern was raised that climate-related funding under current regime is both inadequate and unpredictable. For example, it was noted that against the pledge of US\$2.75 billion, GEF allocation during the second replenishment period was only about US\$648 million. Only 7.2% of bilateral ODA was targeted for climate change-related activities. Balancing publicly-funded R&D with private sector investments is considered a major challenge to address climate issues in the future regime.

### 3.4.7 Unsustainable consumption patterns in Annex I countries

Senior policy-makers in India expressed concern that unsustainable consumption patterns in developed countries continue to contribute significantly to increase in GHG emissions. Only 25% of the global population live in these countries but emit more than 70% of the total global CO<sub>2</sub> and consume 75-80% of many of the world’s resources (Parikh et al., 1991). Several examples to demonstrate sustainable consumption patterns of India, which are linked to inherent lifestyle preferences rather than poverty, were given. For example, CO<sub>2</sub> emissions from the agricultural sector – from the field to the table – are about 0.1 tons CO<sub>2</sub>/million calories in India as against 1.7-2.2 tons in five developed countries (Fig. 3.3).

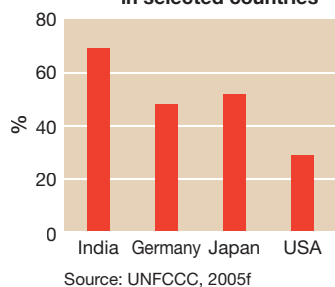
**Concerns for unsustainable consumption patterns in Annex I countries, which contribute significantly to growth in GHG emissions, should be addressed more seriously than requiring developing countries to make commitments.**

**Figure 3.3 CO<sub>2</sub> emissions from the agricultural sector – From field (production) to the table (processed food) – excluding cooking in selected countries**

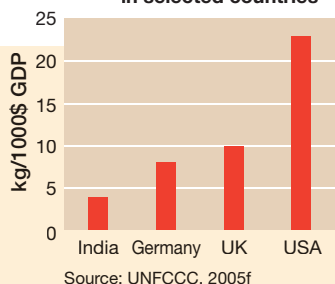


Source: UNFCCC, 2005f

**Figure 3.4 Municipal solid waste recycling (excludes reuse) in selected countries**



**Figure 3.5 GHG emissions from municipal solid waste in selected countries**



Likewise, recycling and the reuse of municipal solid waste is 70% in India as against 30% in the USA (Fig. 3. 4). GHG emissions from municipal solid waste per US\$ 1000 GDP at PPP was 4 kg in India against 23kg in the USA (Fig. 3.5). The estimated CO<sub>2</sub> emissions from transportation per passenger km. are 16, 118 and 193 g in India, EU-15 and USA respectively. It was felt that unless such unsustainable lifestyles in Annex I countries are modified, no effective climate regime beyond 2012 can be envisioned.

### 3.4.8 Capacity concerns

The funding for climate-related activities in India is small - only a fraction compared with many countries of the industrialised world. Consequently, the number of climate change researchers and analysts in India is much smaller than in the developed countries (Kandlikar and Sagar, 1999). Although 452 researchers were involved in the preparation of the initial national communication, very few of them are working on climate change continuously. Policy research on climate change is very limited. Some participants noted that there are very few studies on the potential impacts on the economy of controlling GHG emissions growth by 3 or 5%, compared to the BAU scenario.

## 3.5 Priorities for Restructuring the Climate Regime

Indian participants identified a few options for strengthening the future climate regime (Table 3.3).

**Table 3.3 Options for strengthening the climate regime beyond 2012 from India's perspective**

Issue	Options for strengthening the future climate regime
Market mechanisms	<ul style="list-style-type: none"> <li>Streamlining of the CDM approval process through the reduction of bureaucracy, including reform of the CDM Executive Board.</li> <li>Expanding the scope of the CDM to cover "policy-based" CDM or "sector-based" CDM.</li> <li>Ensuring a guarantee of continuity of the CDM beyond 2012.</li> <li>Delaying the registration deadline beyond December 2005 for projects considering to derive CERs from activities initiated in 2000.</li> </ul>
Adaptation	<ul style="list-style-type: none"> <li>Enhanced focus on science-based adaptation.</li> <li>Development of adaptation strategies to suit natural circumstances.</li> <li>Promotion of public-private partnerships in adaptation.</li> <li>Development of options for mainstreaming adaptation in development through appropriate reorientation of other portfolios.</li> <li>Creation of a Global Adaptation Fund.</li> </ul>
Technology development and dissemination	<ul style="list-style-type: none"> <li>Placing clean technologies under limited public domain.</li> <li>Increased international funding for energy efficient technologies through establishment of funds, such as clean technology acquisition fund or global technology venture capital fund.</li> <li>Amendment of the IPR regime for climate-friendly technologies along the lines of addressing HIV/AIDS.</li> </ul>
Financial assistance	<ul style="list-style-type: none"> <li>Mainstreaming climate financing into ODA.</li> <li>Innovative financing options for technology transfer.</li> </ul>
Capacity building	<ul style="list-style-type: none"> <li>New focus on capacity-building for market mechanisms and adaptation.</li> <li>Capacity strengthening of research on adaptation and GHG mitigation.</li> </ul>
Other initiatives for more effective involvement of developing countries	<ul style="list-style-type: none"> <li>Voluntary pledge and review with assistance.</li> <li>Development of a better incentive structure than in current regime.</li> </ul>

### 3.5.1 Market-based mechanisms

Most participants argued that: (a) the Kyoto process and its flexibility mechanisms should gain further momentum in the future regime, (b) the countries which ratified the Kyoto Protocol should make use of the CDM more proactively, and (c) the countries which have not ratified it should initiate CDM-like mechanisms.

Structural reforms to the current CDM process attracted major attention in consultations. Many participants noted that current CDM approval process, which is complex with high transaction costs, should be streamlined through suitable reforms of the CDM Executive Board. Participants underscored the importance of assurances on: (a) continuity of CDM beyond 2012, and (b) delaying the registration deadline beyond December 2005 for projects hoping to count CERs from activities

initiated since 2000. Expanding the scope of the CDM to encompass sector-based or policy-based CDM was considered especially desirable, as India has many opportunities for energy efficiency improvement. As sector-based CDM would allow the development of projects without pre-established limitations in terms of the territorial coverage or enabling instruments, it is considered as an evolutionary step through which developing countries such as India can increase their participation in the regime (Samaniego and Figueres, 2002). There was also a view, however, that sectoral baseline setting might lead to “capping”, and that the CDM should be limited to a project-based approach due to enormous technical difficulties in setting sectoral baselines. Further promotion of unilateral CDM in the future regime was also considered useful, as such projects may entail relatively lower transaction costs due to project developers not requiring protracted negotiations for emissions reduction purchase agreements (Bhandari, 2004).

***Structural reforms to the current CDM process are urgently needed.***

### **3.5.2 Technology development, dissemination and diffusion**

Many participants noted the need for treating critical climate-friendly technologies as global public goods and suggested that restructuring the IPR regime along the lines of approaches taken to combat HIV/AIDS could be a way forward. One of the options suggested was to place clean technologies under limited public domain and redefine the extent of patent protection for such technologies especially in developing countries. Another option could be to establish a mechanism for the purchase of patent rights of certain technologies through a global technology acquisition fund. While developing countries would not be required to pay any license fees for such technologies, the patent holder could continue to receive license fees for their use in industrialised countries. Other approaches for technology transfer (e.g., shared international IPR along the lines of agricultural technologies by the Consultative Group on International Agricultural Research (CGIAR), compulsory licensing which enables the government to grant a license to a domestic manufacturer of a technology who in turn agrees to pay royalties to the patent holder, and bilateral negotiation along the lines of Costa Rica and the Merck Agreement on biodiversity) may also be relevant for future regime discussions (Ogonowski et al., 2004).

Based on the observation that the major international mechanisms, such as GEF, CDM and Climate Technology Initiative (CTI) have not yet succeeded in promoting dissemination of decarbonisation technologies to developing countries, participants noted the need for adaptive research and development at domestic level and increased funding at international level, especially for energy efficient technologies, through the establishment of a clean technology acquisition fund or a global technology venture capital fund. Even though the Indian parliament enacted the Energy Conservation Act 2000, providing for the efficient use and conservation of energy, participants noted that current energy efficiency in major Indian industries was only around 32-33% and that increasing it to 40% could reduce GHG emissions growth considerably. For example, Schumacher and Sathaye (1999) showed that energy savings of up to 38% could be achieved in India's cement industry through investments in energy efficiency technologies for existing and new plants. Likewise, Chandler et al. (2002) reported that demand- and supply-side efficiency measures alone could avoid 45 million tons of carbon emissions. Participants felt that regional agreements such as the Asia-Pacific Partnership on Clean Development and Climate could be complementary to technology deployment efforts under the future climate regime.

***Critical climate-friendly technologies should be treated as global public goods, and the IPR regime should be restructured to enhance the access for developing countries to these technologies.***

### 3.5.3 Adaptation

Participants overwhelmingly supported the argument for creating a more robust future climate regime to address adaptation. Considering the fact that the research capacity on vulnerability and adaptation in India was limited and that no practical examples of adaptation measures in Asia were reported yet in IPCC reports, participants noted that the future regime discussions should facilitate measures for strengthening research capacity on adaptation. This is especially relevant because uncertainty about the local impacts of climate change is a major bottleneck for designing appropriate adaptation strategies. Many participants underscored the importance of mainstreaming adaptation in natural resource management and recommended that future regime framework should provide avenue for discussions on such options.

***Participants recognised that the flexibility of GEF guidelines should be improved in the future regime, so that GEF funds could be used for enhancing coping capacities at the local level.***

Dissatisfied with current international mechanisms for funding adaptation, participants recognised that the flexibility of GEF guidelines should be improved in the future regime, so that GEF funds could be used for enhancing coping capacities at the local level. Some participants recognised the need for tackling adaptation beyond voluntary agreements, perhaps through the design of an adaptation protocol if necessary, with well-defined commitments. However, some participants questioned the suitability of adaptation for designing a separate protocol and stressed that it is not necessary to create it from scratch because there were other windows of opportunities. Likewise, some participants advised caution in utilising the market-based mechanisms (vouchers, credits, etc.) for facilitating adaptation in the future regime, as they recognised that mitigation and adaptation are not alike. The need for utilising global insurance funds to support adaptation in future regime was also recognised.

### 3.5.4 Capacity-building

Capacity-building towards designing consistent data reporting formats for GHG inventory, collecting data for formal and informal sectors of the economy, and conducting detailed and fresh measurements of Indian emission coefficients was considered crucial. Capacity building in scientific assessment of the impacts of climate change and potential adaptation strategies, especially in water resources sector, were also considered vital.

### 3.5.5 Other issues

Participants noted that the future regime must be flexible enough to duly accommodate national circumstances (e.g., need for poverty alleviation, coal-based energy mix, energy shortage, high fuel prices in terms of PPP in India). The need for creating a better incentive structure in the future regime was also emphasised as a way towards global participation and for more effective involvement of developing countries. As an example, the idea of a “pledge and review with assistance” approach was presented. The idea is that reflecting national interests, priorities and capacity, a developing country would announce its pledge for containing GHG emissions growth. If a country is able to fulfil its commitments, more funds for adaptation and climate-friendly technologies are provided. The provision of assistance can create incentives for fulfilling commitments, even though such commitments are purely pledges and not binding. The participation of the USA in an international framework was also pointed out as an incentive for India to take on commitments in future.

***The need for creating a better incentive structure in the future regime was also emphasised as a way towards global participation and for more effective involvement of developing countries.***

In summary, consultations in India showed that the future climate regime must aim to bridge a number of existing gaps in the current regime. They include: resource gap (gap between needs and available resources); relevance gap (relevance of various policy instruments to suit national circumstances); participation gap (gaps in ability of negotiators and civil society between developed and developing countries); perception gap (gaps in understanding of issues including differential responsibility, capacity and commitment); and, policy culture gap (gaps in policies aimed at GHG mitigation and adaptation).

*Future climate regime discussions should aim to bridge a number of existing gaps in the current regime.*

### 3.6 Epilogue

India plays a significant role in the issue of global climate change not only as a rapidly developing nation with growing GHG emissions, and as a country most likely to experience the negative impacts of climate change, but also through intellectual contributions to the global debate. However, from a national perspective, India is yet to develop a coherent position on climate change and appropriate strategies for international negotiations perhaps because the climate change debate in India is still hedged by several uncertainties on local impacts, and costs of mitigation and adaptation initiatives.

For a developing country like India, the potential conflicts between developmental aspirations and environmental concerns must be resolved. Therefore, helping find energy solutions is as important as raising awareness of climate change in India. Many efforts to moderate GHG emissions growth are already under way in India but they are primarily motivated by concerns on energy security, economics or local environmental issues, such as air pollution. Indian stakeholders repeatedly pointed out that India is not, and will not be a problem in the foreseeable future with respect to climate change, based on the notion that per capita emissions would only be a fraction of that in developed countries for the foreseeable future. However, it is important for India to develop a more proactive position in climate negotiations in order to help build a more equitable and effective regime that can address its interests and developmental aspirations. As climate change can adversely affect all initiatives for sustainable development in India, successful negotiations can be a good means of reducing or postponing future vulnerability and improving its long-term energy and resource efficiency. Rather than sticking to one energy strategy (e.g., over-dependence on coal), it is perhaps important to consider various choices (e.g., joint development of climate-friendly technologies with industrialised countries to share IPRs, finding a niche for itself for bridging the gaps between developed and developing countries).

*It is important for India to develop a more proactive position in climate negotiations in order to help build a more equitable and effective regime that can address its interests and developmental aspirations.*

Indian policy-makers are urged to pursue strategies that take advantage of synergies between climate protection and the overriding development priorities to simultaneously advance both. In this connection, India should be an active and decisive partner in climate negotiations through focussing on strategies, such as the CDM and other innovative mechanisms, that will limit GHG emissions and at the same time help achieve sustainable development. As India is also the home to several millions of vulnerable communities and about 550 million people without access to reliable modern energy services, Indian negotiators must ensure that the future regime would empower and enable them to respond to climate change and its impacts appropriately.



# 4. INDONESIA

## 4.1 Introduction

*Owing to increasing energy demand in Indonesia, growth in CO<sub>2</sub> emissions from energy sector between 2000 and 2010 is estimated to average 6.5% per year.*

Indonesia is the largest ASEAN (Association of South-East Asian Nations) country with 218 million people and rich natural resources (fossil fuels, forests and ocean resources). It is the fourth most populous country in the world and is a member of OPEC. The Indonesian economy has been gradually recovering since the Asian economic crisis in 1997, but it still remains weak with an annual growth rate of 5.1% (2004) which is inadequate to recover to the level prior to 1997. Indonesia currently has proven oil reserves of 4.7 billion barrels, down 13% since 1994. In 2003, crude oil production averaged 1.02 million barrels per day (bbl/d) as against its OPEC production quota of 1.22 million bbl/d. (EIA 2004).

Recently, Indonesia became a net oil importing country. Owing to the decline in oil production, the government intends to change the primary energy source for electricity from oil to domestic coal.

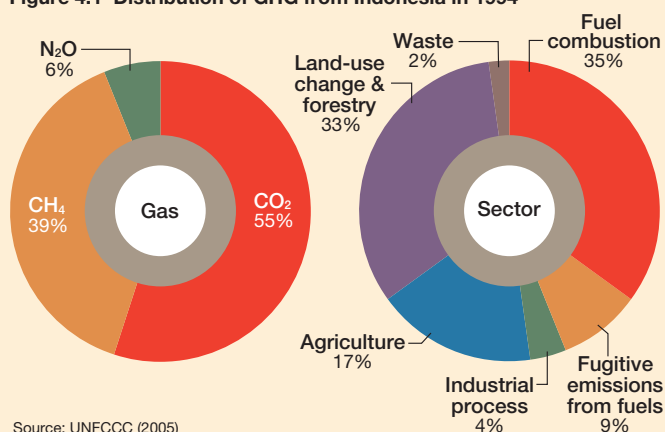
As a result of an increasing energy demand, the growth in CO<sub>2</sub> emissions from the energy sector between 2000 and 2010 is estimated to average 6.5% per year, greater than the primary energy growth rate of 6% per year. CO<sub>2</sub> emissions in 2010 are expected to double that of 2000 (Ministry of Energy and Mineral Resources (MEMR) and Center Energy Information (CEI) 2002). Indonesia has second largest forest area in the world, which functions as one of the world's main "carbon sinks". However, deforestation, due to wildfire and human activities associated with shifting cultivation, has become a serious problem both in terms of GHG emissions and air pollution.

**Table 4.1 Key statistics for Indonesia**

Population (2004)	217.6 million	
Annual Population Growth (2004)	1.35%	
GDP (Current US\$) (2004)	US\$ 257.6 billion	
GDP per capita (2004)		
Current US\$ (2004)	US\$1,184	
Purchasing Power Parity (2004)	US\$3,583	
GNI per capita (Atlas Method) (2004)		
Current US\$ (2004)	US\$1,140	
Purchasing Power Parity (2004)	US\$3,460	
Annual GDP growth (2004)	5.10%	
Energy demand (2002)	156 million Mtoe	
Per capita energy consumption (2002)	736.89 kgoe	
Per capita electricity consumption (2002)	411.01 kWh	
Energy mix (2002)	Oil	36%
	Combustible, renewable and waste	27%
	Gas	21%
	Coal	12%
	Geothermal	3%
	Hydro	1%
GHG Emissions (1994)	343 million MtCO <sub>2</sub> e	
GHG Emissions per capita (2000)	2.40 MtCO <sub>2</sub> e	
CO <sub>2</sub> Emissions (1994)	189 million MtCO <sub>2</sub>	
CO <sub>2</sub> Emissions per capita (2000)	1.31 MtCO <sub>2</sub>	
CO <sub>2</sub> Emissions per GDP (2000)	1.63 kg/US\$	
Forest area	57.95 % of Land	

Sources: UNFCCC (2005g), World Bank (2005), IEA (2005)

**Figure 4.1 Distribution of GHG from Indonesia in 1994**



Source: UNFCCC (2005)

**Table 4.2 GHG emission trends and projections in energy sector in Indonesia (1995-2025)**

	1995	2005	2015	2025
CO <sub>2</sub> (Gg)	215,730	245,890	391,680	672,310
CH <sub>4</sub> (Gg)	2,399.9	2,700.3	2,714.9	2,753.7
N <sub>2</sub> O (Gg)	5.7	6.7	9.1	12.9

Source: MEMR/CEI (2002)

Of all GHGs, CO<sub>2</sub> (55.0%) and CH<sub>4</sub> (39.1%) dominate. Main sectors contributing to GHG emissions include fuel combustion and fugitive emissions from fuel (44%), and forest and agriculture (50%) (Fig. 4.1). In the energy sector, GHG emissions are projected to increase rapidly between 1995 and 2025. For example, CO<sub>2</sub> is projected to increase by more than three times by 2025 (Table. 4.2).

## 4.2 Major Domestic Climate Policies and International Contributions

Table 4.3 Selected domestic policies and measures for climate change

	Issue	Policies and Measures	Remarks
M I T I G A T I O N	Energy efficiency improvement	<ul style="list-style-type: none"> <li>• Reduction of fuel subsidies and fuel price restructuring</li> <li>• Methane recovery from landfill</li> </ul>	
	Promotion of renewable energy	<ul style="list-style-type: none"> <li>• Development of geothermal and hydro power</li> <li>• Off-grid renewable power (solar, micro hydro, etc) development in rural areas</li> </ul>	Electricity Law was rejected by the Constitutional Court.
	Transportation	<ul style="list-style-type: none"> <li>• Integration of public transport system in urban area</li> <li>• Registration for vehicle emission control and use of clean fuel</li> </ul>	Clean air policy
	Carbon sequestration	<ul style="list-style-type: none"> <li>• Prevention of illegal logging</li> <li>• Community-based forest management</li> </ul>	Most of forests are managed by local governments.
	Other initiatives	<ul style="list-style-type: none"> <li>• Improvement of irrigation system on rice field</li> </ul>	
A D A P T A T I O N	Natural resources management	<ul style="list-style-type: none"> <li>• Soil and water conservation measures</li> <li>• Water management Structure Adjustment Programme (WatSAL)</li> <li>• Integration of water management in irrigation, municipal water supply and drainage system</li> </ul>	
	Infrastructure management	<ul style="list-style-type: none"> <li>• Coastal rehabilitation</li> <li>• Upgrade of ports</li> <li>• Flood control system</li> </ul>	Some measures are supported by ODA.
	Other initiatives	<ul style="list-style-type: none"> <li>• Preparation of early warning system for coastal disasters</li> <li>• Food diversification</li> </ul>	

Sources: UNFCCC (2005g), Government of Indonesia (2005)

### 4.2.1 Mitigation policies

In developing policies to combat climate change, Indonesia identified three basic principles: (1) the response strategy cannot be separated from long-term national development strategy (2) the principle of equity and justice must guide the process of anticipating and assessing impact, and (3) net GHG emissions must be reduced without hampering the national development objectives.

Policies in the energy sector, for example, primarily target intensification, diversification and the conservation of energy sources.

Likewise, as methane emissions in the agriculture sector are mainly due to inefficient practices, such as over-irrigation, misuse of fertilisers and poor livestock feeding practices, the focus is to promote improved practices, including water and fertiliser management in paddy fields. In the case of the forestry sector, Indonesia undertook policies such as the prevention of forest fires, the promotion of low impact and sustainable logging, reforestation of damaged forests and development of parks and urban forest.

**Indonesia identified three basic principles to deal with climate change depending on its national circumstances.**

#### **4.2.2 Adaptation initiatives**

Whether intended or not, Indonesia has taken adaptation measures in several sectors, including water resource management, agriculture, coastal defence, damage control for extreme weather events and health care. However, these measures and policies need to be reinforced further to cope with the future impacts of climate change.

#### **4.2.3 International contributions**

Indonesia ratified UNFCCC in August 1994 and the Kyoto Protocol in December 2004. Indonesia hosts the Secretariat of ASEAN Climate Change Initiative which aims to promote information exchange and sharing among government officers and experts of member countries. The Secretariat is currently exploring how to internalise post-2012 issues in formulating ASEAN Climate Initiative. Indonesia is also planning to host MOP3 in 2007. Indonesia's involvement in international negotiations has been limited so far, but, it is expected to take an important role in future.

### **4.3 Assessment of the Current Climate Regime from the Indonesian Perspective**

Nearly all participants recognised that the current climate regime characterized by the UNFCCC and its Kyoto Protocol as a first step to meet the challenge of climate change. They underscored, however, that several challenges remain with respect to restructuring of the climate regime in terms of modifications to market-based mechanisms, technology transfer process, and financial commitments by developed countries.

### **4.4 Major Concerns on the Future Climate Regime**

#### **4.4.1 Developmental and economic concerns**

The UNDP ranks Indonesia at a level of "medium human development", ranking 110 on the list of 183 countries (UNDP 2005a). Developmental issues, such as poverty alleviation are, therefore, the most important while environmental issues have not been a priority issue so far. However, various domestic actors have now begun to recognise the seriousness of climate change. The national mid-term development plan, for example, perceives climate change as one of major threats facing Indonesia. Participants noted that actions against climate change must be taken within the framework of sustainable development.

Indonesia is concerned about its energy security as it has now become a net oil-importer. Further, nearly 50% of its population does not have access to modern energy services. Indonesia is well endowed with renewable energy potential, especially geothermal energy, and has been pursuing the maximum use of renewable energy, but several obstacles, such as the high cost of technology, must be overcome to make renewable energy more competitive against fossil fuels. Inadequate attention to the issues of energy security and development in discussions on the future climate regime was noted as a major concern by Indonesian participants.

*The national mid-term development plan of Indonesia refers to climate change as one of major threats facing Indonesia.*

#### 4.4.2 Equity concerns

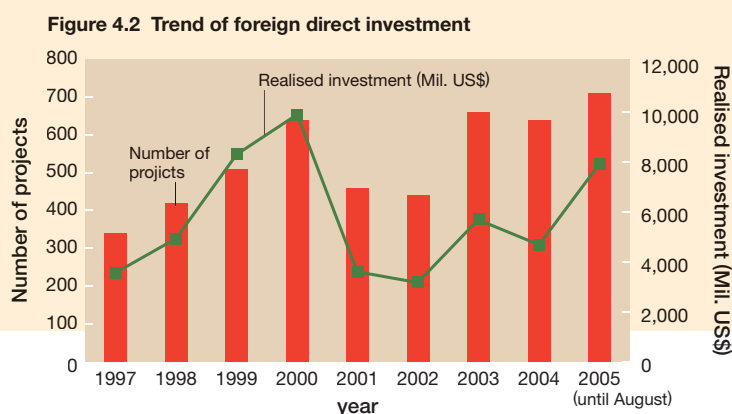
As in other countries, there are two types of equity concerns in Indonesia; domestic and international equity. As noted earlier, nearly 50% of the population live under the poverty line and are the most vulnerable to climate change even though their contribution to climate change is negligible. Participants noted that designing and implementing an equitable national development policy that adequately considers climate change concerns is a big challenge.

In terms of international equity, Indonesian participants noted that the principle of equal but differentiated responsibility should continue to be the basis of the future climate regime. Indonesia accounts for 1.9% of global GHG emissions and 3.7% of world's population. Indonesia's per capita carbon emissions grew significantly between 1980 and 2001, rising from 0.16 metric tons to 0.41 metric tons per person. Despite such rapid growth, per capita carbon emissions were still significantly lower than in industrialised countries or even in other Asian countries, such as the Republic of Korea (2.55), Taiwan (3.18), and Thailand (0.77). Indonesian participants were highly concerned about such wide differences and felt that a staged approach (principles similar to those of the multi-stage approach proposed by Berk and den Elzen 2001) would be appropriate for the participation of developing countries in the future climate regime.

*Indonesian stakeholders asserted that the principle of equal but differentiated responsibility should continue to be the basis of future climate regime.*

#### 4.4.3 Technology development and transfer-related concerns

There was a consensus that technology plays a key role in realising a low-carbon society in the future. Potential benefits of technology transfer were widely recognised, even though there was aspiration for self-reliance on technology development. Participants expressed dissatisfaction with the current pace of technology transfer under the current climate regime. Indeed, Indonesia ranks 102nd among 162 countries in technology diffusion and 60th among 72 countries in the Technology Achievement Index (UNDP 2001). Following the Asian economic crisis in 1997, opportunities for technology transfer to Indonesia considerably decreased with the decline of the foreign direct investment (FDI) and trade (Fig. 4.2), as the spill-over of technologies to developing countries usually occurs through trade and/or FDI (Thee 2001). Another measure to look at the impacts of technology transfer is energy intensity. Indonesia's energy consumption per dollar of GDP increased significantly during the 1980s and 1990s. In 1980, Indonesia consumed



Source: Investment Coordinating Board (BKPM) 2005.

5,760 Btu per \$1995-PPP. In 2001, however, energy intensity rose to 8,250 thousand Btu per \$1995-PPP. Inappropriate factory operations and poor maintenance of technical equipment due to the lack of a budget and technical capacity may have contributed to this. As Indonesia's energy intensity is fairly low compared with other Asian nations (EIA 2004), additional efforts to transfer climate-friendly technologies and capacity-building for appropriate operations and maintenance are necessary.

#### 4.4.4 Market-based mechanism-related concerns

**CDM implementation in Indonesia is far from satisfactory. Complexity of CDM procedures and modalities was considered a major barrier for CDM implementation.**

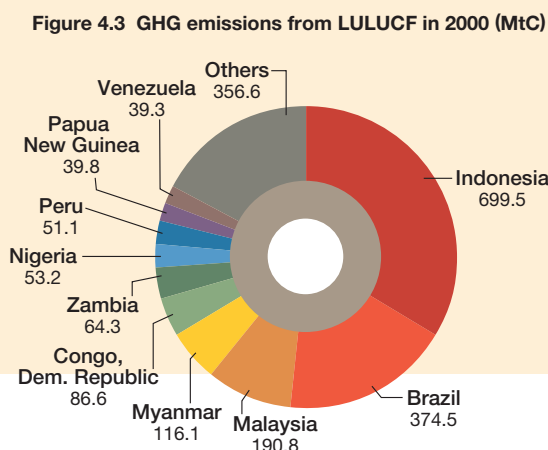
One of the main concerns for Indonesia is how to receive financial assistance to implement mitigation and adaptation measures along with development programmes. The CDM is recognised as one of tools to receive finance. However, most participants in our consultations agreed that CDM implementation in Indonesia is far from satisfactory, as not even a single project was registered by the CDM-EB as of November 2005, although there were twenty-six candidate projects identified by National Strategy Study. In general, the complexity of CDM procedures and modalities, in particular, financial and investment additionality, was considered a major barrier for CDM implementation. Participants noted that such a concept does not necessarily fit into the on-going implementation of national or local policy.

Some participants were concerned that the baseline setting for sector-based CDM is technically more challenging than for project-based CDM if and when sector-based CDM is approved in the future regime. Further, it was felt that the financing of sector-based CDM is more complicated than project-based CDM.

Participants noted that securing underlying finance for CDM projects is a major challenge in Indonesia. Unilateral CDM projects also face an investment problem in Indonesia since it is still difficult to convince the business sector to invest. The use of ODA to support the CDM was vehemently opposed by participants, as they feared that such a practice would divert resources from other developmental activities, such as health and education.

Participants were also concerned about the current rules of the CDM on the LULUCF with regard to ineligibility of deforestation avoidance for the CDM. They argued that the LULUCF contributes to one quarter of the world's CO<sub>2</sub> emissions (Fig. 4.3), that reduction

of emissions through avoidance of deforestation could partly solve the climate change, and that deforestation avoidance should be made eligible for the CDM.



Source: World Resources Institute, 2005

#### 4.4.5 Adaptation-related concerns

Participants noted that Indonesia would face serious problems in adaptation, given the fact that it has a large number of islands and extensive coastal regions which are projected to be adversely affected by rising sea levels associated with climate change. They were concerned that progress in adaptation both at the domestic and the international levels is inadequate. In particular, there were concerns about the amount of funds and their actual functions, since contributions to the Special Climate Change Fund (SCCF) and the LDC Fund have been very limited and the slow progress in CDM implementation made the Adaptation Fund nearly meaningless so far. Participants noted that guidelines for utilising adaptation funds were complicated and that it was unclear what types of adaptation activities could be financed with the Adaptation Fund.

### 4.5 Priorities for Restructuring the Climate Regime

Indonesian participants identified six elements for strengthening the climate regime beyond 2012, and noted that Indonesia would greatly benefit from such changes. They include the extension of the Kyoto Protocol, staged participation of developing countries, technology development, the inclusion of LULUCF, an explicit framework for adaptation and framing the climate agreement in developmental terms. The elements are discussed under separate headings that reflect Indonesia's concerns.

#### 4.5.1 Development and equity

The extension of the Kyoto Protocol is considered the first priority for discussions on the future climate regime. As the current regime is considered a good starting point for the reduction of GHG emissions worldwide, and such action is ultimately beneficial for developing countries, such as Indonesia, most participants agreed that the rejection of the Kyoto Protocol beyond 2012 would disappoint developing countries and it would become difficult to convince them to be involved in a future climate regime. They argued for more credible fixed targets for Annex I countries and the continuation of flexibility mechanisms, especially the CDM.

Insofar as the participation of developing countries in the future climate regime is concerned, Indonesian participants felt that staged participation on the basis of criteria for differentiation, such as equity, would be crucial. They also stressed that the new climate regime and its components must be framed in developmental terms in order to receive the wider attention of, and participation by, developing countries. Such a framework is considered to be beneficial to Indonesia, as climate change has significant implications for its sustainable development.

#### 4.5.2 Technology transfer and capacity-building issues

Participants agreed that the development and deployment of climate-friendly technologies should be undertaken by developed countries more proactively than before, and that new provisions to facilitate transfer and localisation of technologies must be created. In this connection, the implementation of the Bali Strategic Plan for Technology Support and Capacity Building (UNEP 2005), which was developed pursuant to decision SS.VII/1 of 15 February 2002 of the UNEP Governing Council, was considered

*The extension of the Kyoto Protocol is considered the first priority for discussions on future climate regime. Indonesian participants felt that staged participation of developing countries on the basis of criteria for differentiation such as equity would be crucial.*

crucial. Another idea was to create markets and incentives for new technologies in developing countries. It was also suggested that the private sector should be encouraged to facilitate technology transfer since most of technology transfer takes place with trade and/or FDI. Participants also noted the need for the creation of additional provisions in the new regime to facilitate South-South technology transfer.

***Participants strongly recommended streamlining of the CDM procedures in the future regime.***

#### **4.5.3 Market-based mechanisms and LULUCF**

Given the slow progress of CDM implementation in Indonesia, participants strongly recommended streamlining of the CDM procedures in the future regime through the relaxation of additionality, restructuring of administration at the CDM-EB, inclusion of sector-based or policy-based CDM, and making projects for avoidance of deforestation eligible for CDM. Most of these suggestions were already publicised internationally (Ott et al., 2004). Despite concerns on complexity of the baseline setting for sector-based CDM, some participants felt that it is a good option to promote the participation of developing countries in the future regime. In order to alleviate the concerns of potential diversion of ODA away from developmental activities, participants noted that a new special fund under ODA to support CDM could be created.

Since deforestation contributes to nearly 30% of world's GHG emissions, participants suggested the creation of a separate forum or an optional protocol to address deforestation. In addition, options for including LULUCF activities in the future climate regime must be explored (Joannieu Research 2005; Murdiyarto and Herawati 2005). Some participants supported the idea of creating a Forest Rehabilitation Fund proposed by Papua New Guinea at the seminar of governmental experts held in May 2005. The fund could be used for crediting measures to reduce GHG emissions from deforestation.

#### **4.5.4 Adaptation**

Considering the slow progress in implementing adaptation policies both domestically and internationally, participants recommended that future regime discussions must focus on optimal ways to support adaptation in developing countries. Many participants recognised the need for mainstreaming adaptation concerns in developmental policy. As ODA covers several sectors (agriculture, water resources, health, coastal resource management) that are directly impacted by climate change, participants recommended integration of adaptation concerns in ODA policies and programmes by developed countries (Bratasida and Sari 2005).

***Participants proposed the formulation of an insurance scheme along the lines of a scheme developed by the International Maritime Organisation (IMO) to cover oil spills.***

The need for improving the clarity of guidelines for using various adaptation funds was emphasised. Response to the creation of a separate protocol for the adaptation in the future climate regime was muted. Many participants felt that the creation of such a protocol would consume a lot of time and resources. Instead, they suggested that bilateral discussions among governments could be more effective. Some participants proposed the formulation of an insurance scheme along the lines of a scheme developed by the International Maritime Organisation (IMO) to cover oil spills. The proposed scheme is tied to the compliance system, i.e., those countries that fail to meet the Kyoto targets have to contribute to the insurance fund.

## 4.6 Epilogue

Indonesia is strongly concerned about development issues like energy security, forest conservation, and poverty alleviation. Such concerns force policy-makers to focus primarily on ways to maximise economic development. However, as economic development is tightly linked with GHG emissions, it is important that Indonesian policy-makers address climate issues within the framework of sustainable development through measures such as energy efficiency improvement. As most participants agreed that the CDM is an innovative mechanism that can promote sustainable development while reducing GHG emissions, Indonesian policy-makers should take steps to facilitate the CDM by streamlining procedures domestically and by proposing various ways to strengthen the CDM in both current and future climate regime. As LULUCF is another key to linking development issues and climate concerns in Indonesia, negotiators and policy-makers should identify new ways by which future climate regime discussions can address concerns on LULUCF more thoroughly than before. Likewise, as several regions and communities of Indonesia are extremely vulnerable to impacts of climate change, it is important to raise the policy profile of adaptation both nationally and internationally. As a host of the Secretariat of the ASEAN Climate Change Initiative, we can be optimistic that Indonesian policy-makers and negotiators will actively contribute to finding solutions to the problems associated with climate change.

*It is important that Indonesian policy-makers address climate issues within the framework of sustainable development through measures such as energy efficiency improvement.*



# 5. JAPAN

## 5.1 Introduction

*Japan's total GHG emissions in 2003 were 1339 MMt CO<sub>2</sub> eq, an increase of 12.8% over emissions in 1990.*

Japan is the world's second largest economy following the USA and the fourth largest energy consumer and GHG emitter following the USA, China and Russia. Being the only Annex I Party in Asia, its interests often differed from those of other Asian countries in the past and such differences are likely to continue in future. On the other hand, Japan established close relationships with Asian countries on economic, energy, and foreign affairs. Such relationships work in both ways – to exert influence on, and to be influenced by, other Asian countries.

It must be noted that the approach for our consultations in Japan was different from the one we adopted in other countries, as we could not organize a formal dialogue due to time constraints. Instead, we prepared this report based on literature reviews, and interviews with twenty representative stakeholders (four each from the government and the private sector, two from environmental NGOs, and ten from research institutes).

Japan's total GHG emissions in 2003 were 1,339MMt CO<sub>2</sub> eq, an increase of 12.8% over emissions 1990 (Table 5.1 and Fig. 5.1). Compared to emissions in the base year under the Kyoto Protocol (1990 for CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O; 1995 for HFCs, PFCs, and SF<sub>6</sub>), however, the increase was 8.3% (MoE 2005b). The increase in total and per capita CO<sub>2</sub> emissions over the 1990 levels was 12.2% and 8.7% respectively. On the other hand, CO<sub>2</sub> emissions per unit of GDP decreased by 5.2% since 1990 (MoE 2005b). Of all gases, emissions of CO<sub>2</sub> were the largest. The energy sector accounted for the most emissions (89.5%), followed by industrial processes (5.6%), agriculture (2.5%) and waste (2.4%) (Fig. 5.2).

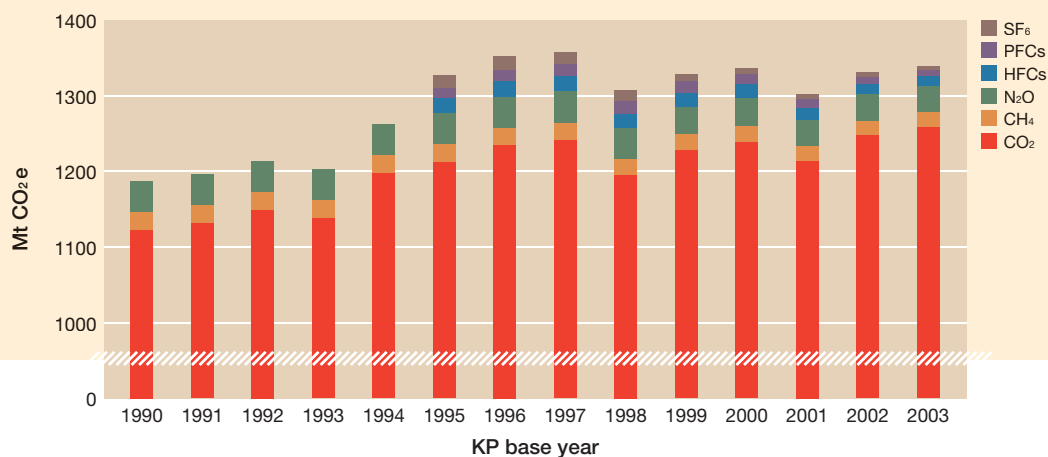
Current projections indicate that total GHG emissions in Japan will decrease by 1.6% in 2010 relative to 2002, still a 6.0% increase compared to 1990 level (GWPH2005) (Table 5.2).

**Table 5.1 Key statistics for Japan**

Population (2004)	127.8 million	
Annual Population Growth (2004)	0.15%	
GDP (Current US\$) (2004)	US\$ 4,623.4 billion	
GDP per capita (2004)		
Current US\$ (2004)	US\$36,177	
Purchasing Power Parity (2004)	US\$29,539	
GNI per capita (Atlas Method) (2004)		
Current US\$ (2004)	US\$37,180	
Purchasing Power Parity (2004)	US\$30,040	
Annual GDP growth (2004)	2.70%	
Energy demand (2002)	517 million Mtoe	
Per capita energy consumption (2002)	4,057.54 kgoe	
Per capita electricity consumption (2002)	7,718.45 kWh	
Energy mix (2002)	Oil	52%
	Coal	17%
	Natural Gas	13%
	Nuclear	13%
	Others	5%
GHG Emissions (2003)	1,339 million MtCO <sub>2</sub> e	
GHG Emissions per capita (2000)	10.51 MtCO <sub>2</sub> e	
CO <sub>2</sub> Emissions (2003)	1,259 million MtCO <sub>2</sub>	
CO <sub>2</sub> Emissions per capita (2000)	9.34 MtCO <sub>2</sub>	
CO <sub>2</sub> Emissions per GDP (2000)	0.25 kg/US\$	

Sources: IEA (2005), MOE (2005b), UNFCCC (2005g), World Bank (2005)

**Figure 5.1 Japan's GHG emissions trend (1990–2003)**



Note: SF<sub>6</sub> = sulphur hexafluoride; PFCs = perfluorocarbons; HFCs = hydrofluorocarbons; N<sub>2</sub>O = nitrous oxide; CH<sub>4</sub> = methane; CO<sub>2</sub> = carbon dioxide

Figure 5.2 Distribution of GHG from Japan in 2003

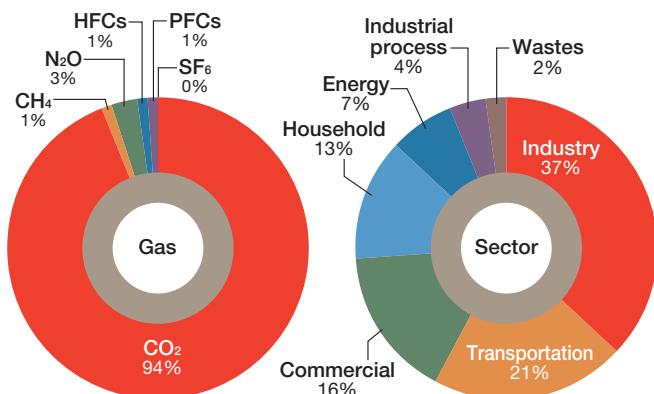


Table 5.2 Projection of Japan's energy-related CO<sub>2</sub> emissions in 2010 compared to the 2002 level (%)

Emissions	Per cent
Total GHG emissions	+ 6.0
Energy-related CO <sub>2</sub>	+ 5.4
HFCs, PFCs, and SF <sub>6</sub>	+ 1.4
Non-energy-related CO <sub>2</sub> , methane, N <sub>2</sub> O	- 0.8

Source: GWPH 2005.

## 5.2 Major Domestic Climate Policies and International Contributions

### 5.2.1 GHG mitigation policies

The establishment of the Global Warming Prevention Headquarters (GWPH) in December 1997 soon after the adoption of the Kyoto Protocol, was the first formal initiative to institutionalise the process of controlling GHG emissions in Japan on a national basis. The guidelines for measures to prevent global warming were drafted initially in June 1998 and then revised in March 2002. More than 100 policy measures, including energy efficiency improvement, voluntary declaration by industries, R&D for new energies, were drawn up to achieve the six per cent reduction target of the Kyoto Protocol (GWPH 2002). Japan conducted a review of policies and measures to achieve its Kyoto target in 2004 with the aim of introducing additional measures from 2005 if the revised guidelines are found to be inadequate to achieve the target. The review will not end with a mere revision of the guidelines, however. The entry into force of the Kyoto Protocol on 16 February 2005 requires drafting of the Kyoto target achievement plan as per article 8 of the Climate Change Policy Law (CCPL). In view of the projections that the GHG emissions in 2010 will be 1.6% lower than the 2002 level, but still 6% higher than the 1990 level, the following reduction targets were set for each sector (Table 5.3). The expected contributions of various policy measures to GHG reduction in industrial, household, transportation and energy supply sectors were also outlined (Table 5.4).

Regarding the additional policies and measures to achieve the required reductions, discussions during the review process focussed on the introduction of environmental tax, emissions trading scheme and GHG reporting scheme. It was decided that the introduction of an environmental tax was set to be discussed in the framework of the revision of the whole tax system in the autumn of 2005. A Japanese Voluntary Emissions Trading Scheme (JVETS) was launched with the participation of thirty-four companies, which covers the trading of only 27 MMt CO<sub>2</sub>. The GHG emissions reporting scheme was also introduced as a revision to the CCPL. The above overview of Japan's climate policy revealed that the policies and measures implemented so far are inadequate to bring enough emission reductions to achieve the Kyoto target (Watanabe, R. 2005). Whether Japan can ultimately achieve its target depends on measures taken following the second review to be conducted in 2007.

**GHG emissions in 2010 are projected to be 1.6% lower than the 2002 level, but still 6% higher than the 1990.**

Table 5.3 Targeted GHG reductions (%) in various sectors by 2010 compared to from 2002

Category	%
Difference between emissions in 2002 and the projected emissions in 2010	- 1.6
Reductions from Policies and Measures	- 6.5
CO <sub>2</sub>	- 4.8
Methane, N <sub>2</sub> O	- 0.4
HFCs, SFCs, SF <sub>6</sub>	- 1.3
Sinks	- 3.9
Kyoto Mechanisms	- 1.6
<b>Total</b>	<b>- 12.6</b>

Source: GWPH 2005.

**Table 5.4 The Kyoto Target Achievement Plan's measures for sectors and reduction targets**

Sector	Policies and Measures	Reduction targets (thousand tonnes)
Industry	Keidanren's voluntary action plan	4,240
	R&D on fuel switching of high-efficiency boilers and lasers	200
	Promotion of high-efficiency industrial furnaces	130
	Energy management as set out in the revised ALRUE (Amended Law concerning Rational Use of Energy)	170
Households	Diffusion of efficient air conditioners for commercial buildings	60
	Improvement of energy efficiency in homes	850
	Promotion to replace old electric appliances with more efficient ones	560
	Promotion of high-efficiency water heating	340
	Promotion of home and business energy management systems	1,120
Transportation	Accelerated introduction of vehicles achieving top-runner programmes	2,100
	Acceleration of R&D and dissemination of low-emission vehicles, including clean energy vehicles	300
	Promotion of efficiency logistics systems, including shift of transport modes from trucking to shipping	120
	Introduction of sulphur-free fuel, and vehicles to use such a fuel	760
Energy supply	Promotion of new energy	1,700
	Fuel switching and nuclear power	4,690

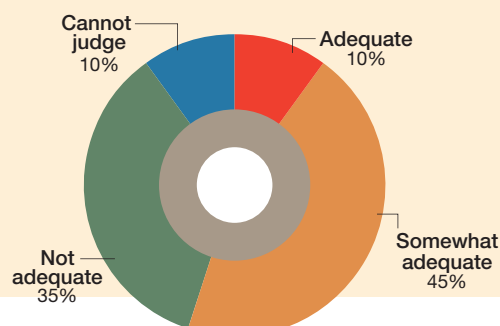
Source: GWPH 2005.

### 5.2.2 An assessment of stakeholders' views on Japan's climate policies and measures

**Current policies and measure are inadequate to bring enough emission reductions to achieve the Kyoto target.**

All interviewees, except two government officers, regarded that Japan's current climate policies and measures are not adequate to achieve the Kyoto target, although some of them admitted the positive role of such efforts (Fig. 5.3). Most of the interviewees shared the view that R&D should be strengthened and that the Kyoto mechanisms should be utilised more fully. The views on the introduction of an environmental tax and an emissions trading scheme were both positive and negative.

**Figure 5.3 Diversity of views of different stakeholders on adequacy of Japan's policies and measures to reach the Kyoto emissions reduction target**



### 5.2.3 Adaptation initiatives

Japan has conducted many studies on the impacts and risks of global warming since 1990s, in a wide range of areas, including water resources, terrestrial ecosystems, agriculture, forestry and fisheries, marine environment, coastal zones, land preservation, disaster prevention, lifestyles, industry and energy, and human health (Harasawa et al. 2003). The impact of global warming is seen in the form of a rising trend of the mean annual temperature by about 1°C over the past 100 years. This rise in temperature began accelerating in the mid-1980s. Of the ten hottest years in the past century, eight were in the past decade, coinciding with the global trend. The rise in temperature in urban areas over the past 100 years has been more than 2°C, and in Tokyo nearly 3°C. This large rise in the urban areas was partly due to the heat island phenomenon peculiar to cities. Even after excluding this phenomenon, Japan is certainly warming (Harasawa et al. 2003, Harasawa 2005, Watanabe, N. 2005).

Despite the observed impacts, Japan has not implemented specific adaptation plans. One of the reasons for this may be that Japan, being a natural disaster-prone country, has already established a sound infrastructure that will be utilised for the adaptation to the impacts. Nevertheless, considering that Japan is surrounded on all sides by the sea, and its population and social capital are highly centralised in narrow plains near the coast, strengthening mitigation policies in order to avoid an extreme climate change and developing adaptation plans in order to prepare for a possible extreme climate change are crucial (Harasawa 2005).

### 5.3 Assessment of the Current Climate Regime from Japan’s Perspective

There are both positive and negative assessments of the Kyoto Protocol. All interviewees agreed that the Protocol is the first important step to addressing climate change and admitted that many policies and measures were developed in Japan, although they are inadequate to achieve the Kyoto target. Secondly, it is the only major multilateral environmental agreement adopted in Japan which stimulated a tremendous level of public interest (Kameyama 2004a).

On the negative side, interviewees admitted that the Kyoto Protocol makes very limited contribution to stabilising the GHG concentrations. The main reasons for the negative assessment were as follows: Agreement to bring about only a small percentage of GHG reductions by Annex I Parties (5.2%), and, the lack of participation of major emitters, especially the USA.

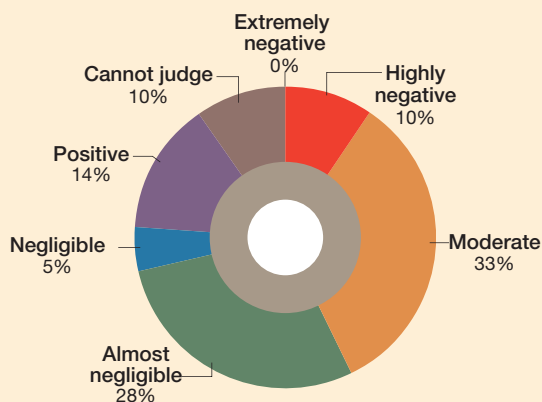
*All interviewees agreed that the Protocol is the first important step to address climate change and admitted that many policies and measures were currently developed in Japan, although they are inadequate to achieve the Kyoto target.*

### 5.4 Major Concerns on Current Climate Regime

#### 5.4.1 Development and economic concerns

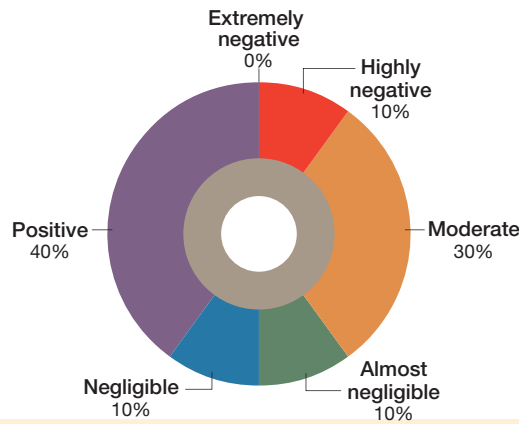
Japan’s marginal cost to achieve the Kyoto target is the highest, with the median at US\$ 300/tC, while its GDP loss is relatively small at 0.7% (IPCC 2001a). Japan’s lack of energy industries, such as crude oil production, is the main reason for this (Morita et al. 2003). The cost and benefit to achieve further reductions depends on the future progress of technological innovations and new information concerning the carbon cycle. (Morita et al. 2003).

Figure 5.4 Diversity of responses to the potential impact of mitigation measures on economic growth of Japan.



The interviews confirmed that Japanese concerns regarding the impact of climate mitigation measures on both economic growth and industrial competitiveness are not so large, with only 10% and 10% marked “highly negative” respectively (Figs. 5.4 and 5.5).

**Figure 5.5 Diversity of responses to the potential impact of mitigation measures on industrial competitiveness of Japan.**



The result shows that development and economic concerns are not one of major obstacles for Japan to take actions to address climate change issues.

#### 5.4.2 Equity concerns

In the absence of a supra-national enforcement institution for an international agreement, any solution of agreement must be considered equitable by all participants. Probably, the most inequitable outcome of all would be reaching no agreement at all (Hoehne et al. 2003).

Equity regarding the target setting is considered as one of the biggest problems in Japan. In the negotiations of the Kyoto Protocol, the Ministry of Economic Trade and Industry (METI), reflecting the opinion of industries, argued that stabilisation of emissions would be the most that Japan could hope to achieve, considering that Japan made a lot of efforts to raise its energy efficiency during past two decades. This argument was in a way rational because energy consumption per GDP was the lowest in Japan (Table 5.5). A 6% reduction target set in the Kyoto Protocol was more ambitious than what Japan had originally planned for. Even compared to 7% for the USA and 8% for the EU, 6% was considered a tough target for Japan.

**Table 5.5 International comparison of energy consumption per GDP in 2000**

Basis for comparison	China	Japan	Korea	India	USA	UK	Germany
Exchange rates	100	10	40	102	22	16	17
PPP	100	68	104	92	105	73	73

Source: SHEN (2003)

***Development and economic concerns are not major obstacles for Japan to take actions to address climate change issues.***

Before and during the Kyoto negotiations, the participation of the USA and differentiation of emissions reduction targets among Annex I countries were the most sought-after points for Japan (Kameyama 2004a). The Protocol was accepted in Japan with the understanding that the USA would be involved. An ambitious target without any rationale in terms of equity became a problem after the USA withdrew from the Kyoto Protocol. In our consultations, 90% of interviewees considered that the 6% emissions reduction target of the Kyoto Protocol is not equitable for Japan. However, the interviews noted that Japanese stakeholders do not link the criteria of "equity" with their preferences of the way to set the target. While researchers have a tendency to select "egalitarian," others select "basic needs," "capability," and "responsibility", which are largely based on moral principles (den Elzen et al. 2003). While one of the government representatives mentioned that "equity" is defined by the mixture of all of them, another representative mentioned that any internationally agreed decision is always equitable since parties agree with only "equitable" text as "equity" is necessary for domestic constituencies' acceptance of the negotiation results.

One of the reasons for no linkages between the criteria of “equity” and the preferences for the way to set the targets is perhaps that there is no acceptable criterion which is beneficial for Japan. Some interviewees clearly expressed preference for a GHG intensity target, which is beneficial for Japan. It may be worth considering the inclusion of an element of reduction potential if we wish to build on the equity principle (Ott et al. 2004).

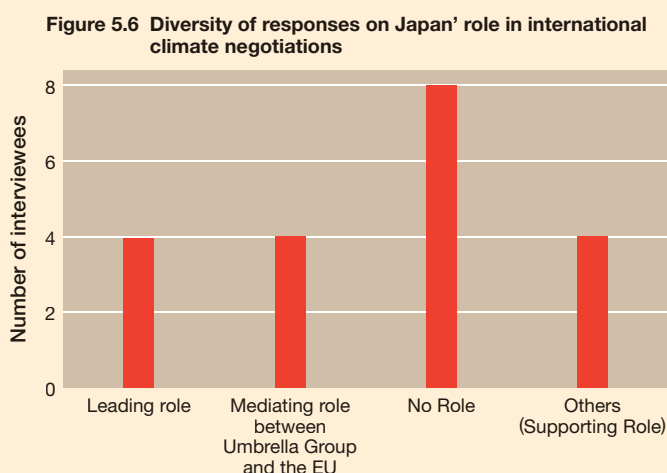
### 5.4.3 Negotiation-related concerns

The climate negotiations were regarded as a big problem for Japan. Empirical studies showed that Japan had difficulty in forming a unified position at the Kyoto negotiations (Kameyama 2004a, Tanabe 1999, Schreurs 2002, Schroeder 2001). The imbalance between the time necessary for the negotiation and the short term of administrative policy changes is also considered a major problem (Aiba and Saijo 2003).

In our interviews, in line with empirical studies, some of the non-governmental interviewees argued that Japan neither played a significant role in international negotiations nor succeeded in reflecting its interests in the negotiation, while governmental stakeholders noted that Japan played a leading role in international negotiations. Some non-governmental representatives had the opinion that Japan was a mediator between the EU and the USA or was just supporting either of them. Indeed, there was not a single issue discussed at Kyoto on which Japan held a view opposing both the EU and the USA positions at the same time (Schroeder 2001). As such, a discrepancy in views of governmental and non-governmental stakeholders was observed. As for the reasons why Japan did not play a significant role in the international negotiations, most of interviewees identified the lack of (a) a unified position among its internal stakeholders (or governments), (b) experienced negotiators (working level and high-level), and (c) communication skills. Indeed, the Japanese negotiators who attended the COP less than twice by the COP8 accounted for 73%, against 53% from the EU and 52% from the USA (UNFCCC 1995- 2002).

*A discrepancy in views of governmental and non-governmental stakeholders on Japan’s role in international climate negotiations was observed.*

*The lack of unified position among internal stakeholders, experienced negotiators, and communication skills are major reasons for Japan’s limited role in international climate negotiations.*



#### 5.4.4 Market-based mechanisms-related concerns

The Kyoto mechanisms are one of the main achievements of the Kyoto Protocol for reducing GHG mitigation costs. The marginal cost of emissions reduction in Annex I countries was projected to be between US\$15 and 150/t C with the GDP loss ranging from 0.1% to 1% (IPCC 2001a). Since Japan has the highest marginal cost, however, it was expected to receive the largest cost-reduction benefit due to the Kyoto Mechanisms.

Despite high expectations of a positive effect on mitigation, the Kyoto mechanisms did not work as they were originally planned. One of the reasons was the delay of entry into force of the Kyoto Protocol. This affected the establishment of an infrastructure by the Parties, including registry, inventory, etc., necessary for fulfilling the eligibility requirements to utilise the Kyoto Mechanisms. Because of this, it is likely that Russia and Ukraine, two large sellers, will not transact their surpluses at least at the beginning of the first commitment period (Watanabe et al. 2005). There is also a possibility that both countries will control the carbon market and price, which can have a negative impact on the market function (Watanabe et al. 2005). Another much bigger issue is concerning the CDM. Various issues, including a strict definition of additionality, delays in approval process at the CDM Executive Board, a lengthy project approval process in both host countries and at the Executive Board, and high transaction costs hamper the CDM to function as originally planned (Ellis et al. 2004, Sterk and Wittneben 2005).

Our consultations confirmed that all interviewees were not satisfied with the pace of current implementation of the Kyoto mechanisms due to the aforementioned reasons.

**Our consultations confirmed that all interviewees were not satisfied with the pace of current implementation of the Kyoto mechanisms.**

#### 5.4.5 Technology development and transfer-related concerns

Technology development and transfer is another promising means of reducing mitigation costs. An overview of the technological potential for reducing GHG emissions in 2010 and 2020 is presented in Table 5.6.

**Table 5.6 Potential for emissions reduction by 2020**

Category	Potential emissions reduction in 2010 (Mt Ce/year)	Potential emissions reduction in 2020 (Mt Ce/year)
Buildings	700~750	1000~1100
Transportation and Mobility	100~300	300~700
Industry		
-Energy efficiency improvement	300~500	700~900
-Material efficiency improvement	~200	~600
Gases other than CO <sub>2</sub>	~100	~100
Agriculture	150~300	350~750
Waste	~200	~200
Use of alternatives under the Montreal Protocol	~100	n.a.
Energy supply and source switchover	50~150	350~700
<b>Total</b>	<b>1900~2600</b>	<b>3600~5050</b>

Note: Reduction potentials are calculated on the basis of technologies to be introduced in the market with a direct cost of US\$100 or less per ton carbon equivalent.  
Source: Morita et al. (2003).

Despite the high potential of various technologies to reduce GHG emissions, transfer of technologies has not been progressing due to various obstacles, including the inadequate dissemination of information on new technologies, a cautious attitude of the management to introduce new technologies, a negative tendency among banks and other financial institutions toward investment in new technologies, and the lack of progress in new technology transfers to developing countries due to concerns over intellectual property rights (Morita et al. 2003).

In our consultations, interviewees agreed that technologies are very important to address climate change. They considered that this is an area that Japan could contribute greatly. However, the lack of an appropriate system in the current regime to enhance the development and transfer of technologies hampers Japanese companies to take proactive actions to transfer advanced technologies to developing countries.

## **5.5 Priorities for Restructuring the Climate Regime**

### **5.5.1 Market mechanisms**

Although several interviewees expressed concern on the current pace of implementation of the Kyoto mechanisms, they noted that flexible mechanisms should be continuously used after suitable modifications in the future climate regime. Stakeholders recommended streamlining of the CDM procedures, including the simplification of methodological processes and reform of the CDM-EB. Some stakeholders noted that the establishment of a scheme similar to the CDM, which combines technology transfer with credits, is perhaps necessary to give incentives to industries for technology transfer and to ultimately address the climate change issue in the most efficient way. In addition to the CDM reform, most of the interviewees noted the need to reconsider the supplementarity requirement, because of the current difficult situation of Japan to achieving its targets with domestic policies and measures alone.

### **5.5.2 Technology issues**

All interviewees regarded that more focus on climate-friendly technologies is necessary for addressing this issue. However, they recommended that the future regime should provide incentives to technology development and transfer, perhaps through enabling technology transfer in exchange of carbon credits.

*The establishment of a scheme similar to CDM, which combines technology transfer with credits, is necessary to give incentives to industries for technology transfer and to ultimately address climate change issue in the most efficient way.*



*Japanese views on the future climate regime are two-fold, one supporting the continuation of the Kyoto-type regime with numerical targets, another supporting more flexible targets such as the pledge and review.*

## 5.6 Epilogue

Japanese views on the future climate regime are two-fold: one supporting the continuation of the Kyoto-type regime with numerical targets, and another supporting more flexible targets, such as the pledge and review. Such divergence of views was often evident even at the international arena, like COP and SB side-events, where the MoE and the METI often presented different reports (MoE 2005a, METI 2004). Our consultations with selected people confirmed the above. All interviewees agreed that the international regime is necessary to address the climate change issue but their views differed regarding the form, elements to be included, duration of the commitment period, the continuity, and the participation of Non-Annex I Parties.

**Form:** All interviewees agreed on the necessity of the UNFCCC and most of them saw the need for a Protocol or similar kind of legal agreement. However, different views prevailed on the elements to be included in the Protocol or legal agreement.

**Elements to be included:** The most contentious point is the necessity of a legally-binding numerical target. Some experts supported the continuation of the Kyoto-type numerical target while others supported the pledge and review type agreement, including all industrialised countries and large GHG emitters. Industrial stakeholders showed their preference to sector-based targets, but most of them admitted that the national government can only take the final responsibility on reduction commitment. One stakeholder suggested that the combination of multi-level targets, such as a regional-level target like the EU bubble with sector-based targets, which might be flexible in terms of achieving targets and efficient in terms of negotiation, rather than allocating commitments to the Parties. Industry representatives preferred the pledge and review with “agreement on technology development” and “coordination of policies and measures on energy efficiency standards or technology standards,” regardless of whether it is contained in the international agreement for climate change or not. Other interviewees who emphasised the need for a legally-binding numerical target also chose the above two elements, besides “the establishment of emissions trading and linking it with other countries”.

**Duration of the commitment period:** Interviewees who felt that numerical targets were unnecessary, mentioned that five years is too short and preferred to have a longer term from ten to thirty years. The other group, advocating the need for numerical targets, noted that a short term is necessary to review the achievement of targets.

**Continuity:** The interviews revealed the difficulty in keeping the balance among the participation of the major GHG emitters, the continuity, and the strictness of commitments. Most of the interviewees opined that the post-Kyoto regime must be started immediately after 2012, but the opinion was diverse in preference regarding continuity versus the strictness of commitments. Several interviewees, especially from the industrial sector, preferred the continuity in order to give a right signal to the market, while one stakeholder explicitly mentioned that the strictness of commitments should not be sacrificed for the continuity.

**The participation of non-Annex I parties:** All interviewees who advocated “the pledge and review” noted that at least the large GHG emitters should and can have the same type of commitment as Annex I Parties. On the other hand, interviewees who

selected “legally- binding numerical target” noted that the differentiation of commitments is necessary between the Annex I and the Non-Annex I Parties but it is desirable that large GHG emitting Non-Annex I Parties participate in the regime with a softened form of commitments, such as the pledge and review.

All interviewees agreed that participation of the other large GHG emitters and enhancing technology development and transfer are necessary to stabilise GHG concentrations and that the CDM should be reformed to provide further incentives for technology development and transfer. The need for technology development and transfer, and the reform of the CDM were recognised by other Asian countries as well and these areas could be suitable for more effective involvement of the developing countries. Therefore, these two issues could be a basis for strengthening collaboration between Japan and the rest of Asia.

In our consultations, several interviewees noted that the views of Japanese stakeholders are not adequately represented at international negotiations, partly because of the lack of negotiating ability, which, in turn, is attributed to the frequent transfers of personnel involved in such negotiations. In order to build a consensus and represent a unified view to the global community, it would be worthwhile to retain key senior negotiators at the same position for a longer time, especially because such negotiations require considerable technical knowledge. Efforts in this direction are vital to further enhance the Japan’s role in climate discussions for the benefit of the world in general and the Asia-Pacific region in particular.

## **Acknowledgement**

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*The interviews revealed the difficulty to keep the balance among the participation of major GHG emitters, the continuity, and the strictness of commitments.*

*In order to build a consensus and represent a unified view to the global community, it would be worthwhile to retain key senior negotiators at the same position for a longer time.*

# 6. REPUBLIC OF KOREA

## 6.1 Introduction

*Nearly 84% of GHG emissions in ROK are from the energy sector.*

The Republic of Korea (ROK, hereafter) is one of the most economically-advanced developing countries in Asia and a member of the OECD, and is ranked as the eleventh largest economy in the world. ROK experienced an average annual economic growth rate of 8.8% between 1986 and 1995. Trade in goods accounted for 66% of GDP in 2002 (World Bank 2004), and rapid growth in trade has been the driving force behind the Korean economy. The mining and manufacturing, and the services industry accounted for 39.1%

and 46.8% of the total industrial structure, respectively. In the last two decades, ROK doubled its income per capita to US\$ 9,025 in 2001, which is two-thirds of the OECD average. Rapid economic growth and an increase in income per capita have led to a sharp increase in GHG emissions per capita, which have already exceeded those of Japan and the EU. The total GHG emissions increased by 5.2% annually between 1990 and 2001, and CO<sub>2</sub> emissions reached 451 MMT in 2001 (Table 6.1). Consequently, the ROK has thus become the eighth largest emitter in the world (World Bank 2004).

Of all GHG, CO<sub>2</sub> emissions were largest and the energy sector was the largest source of emissions (Fig.6.1). Most CO<sub>2</sub> emissions occur from fuel combustion, mainly attributed to power generation and the transport sector. Given the expectation of the continuous economic growth of ROK, its GHG emissions are projected to rise by 70% above 2000 levels by 2020 (UNFCCC 2005g).

**Table 6.1 Key statistics for ROK**

Population (2004)	48.1 million
Annual Population Growth (2004)	0.48%
GDP (Current US\$) (2004)	US\$ 679.7 billion
GDP per capita (2004)	
Current US\$ (2004)	US\$14,131
Purchasing Power Parity (2004)	US\$20,371
GNI per capita (Atlas Method) (2004)	
Current US\$ (2004)	US\$13,980
Purchasing Power Parity (2004)	US\$20,400
Annual GDP growth (2004)	4.60%
Energy demand (2002)	203 million Mtoe
Per capita energy consumption (2002)	4,271.58 kgoe
Per capita electricity consumption (2002)	6,171.14 kWh
Energy mix (2002)	
Fossil Fuel	84%
Nuclear energy	15%
Traditional biomass and other renewable sources	1%
GHG Emissions (2001)	508.7 million MtCO <sub>2e</sub>
GHG Emissions per capita (2000)	11.18 MtCO <sub>2e</sub>
CO <sub>2</sub> Emissions (2001)	450.7 million MtCO <sub>2</sub>
CO <sub>2</sub> Emissions per capita (2000)	9.08 MtCO <sub>2</sub>
CO <sub>2</sub> Emissions per GDP (2000)	0.83 kg/US\$

Sources: UNFCCC (2005g), World Bank (2005), IEA (2005)

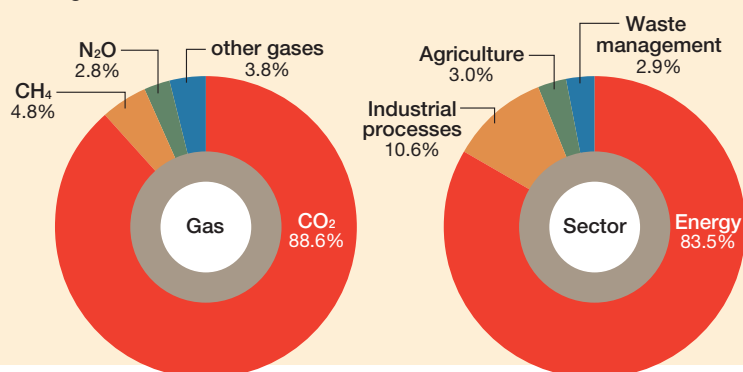
## 6.2 Major Domestic Climate Policies and International Contributions

The ROK has taken various policies and measures related to energy conservation and GHG reduction. In 1998, the government established the Inter-ministerial Committee on the Convention on Climate Change chaired by the prime minister. The two three-year comprehensive National Action Plans (NAP) had been adapted in 1999-2001 and 2002-2004, and the third NAP (2005-2007) was recently prepared. A summary of selected GHG mitigation and adaptation policies and measures are shown in Table 6.2.

### 6.2.1 GHG mitigation policies

About 84% of the total GHG emissions in 2001 came from the energy sector, such as fuel consumption and fugitive emissions. Hence, the reduction of the GHG emissions in the energy sector is of utmost importance. On the other hand, most of the energy policies in the ROK have been formulated to enhance the national

**Figure 6.1 Distribution of GHG emissions from ROK in 2001**



Source: UNFCCC, 2005gx

energy security and the improvement of efficiency in energy consumption for achieving sustainable development. Such concerns on energy security provide the basis for policy direction of GHG mitigation. Another important policy area is transportation. With a rapid increase in economic growth and per capita income, the demand for transportation has been rising and is expected to grow sharply. The share of transportation in the final energy demand is projected to rise from 20% to 23.1% between 2001 and 2020 (Yoo 2004).

### 6.2.2 Adaptation policies

The negative impacts of climate change on agriculture, forestry and fisheries, the coastal and marine environment, terrestrial ecosystem, and human health are increasingly perceived as a serious threat to the ROK. Various policies and measures to counter such impacts are being taken in each corresponding sector.

### 6.2.3 International contributions

The ROK is an active participant in international climate negotiations. For example, it had proposed unilateral CDM as one of the market-based mechanisms that could promote voluntary GHG reduction activities by non-Annex I countries (Kim 2000). The CDM Executive Board accepted the notion of unilateral CDM in February 2005.<sup>1</sup>

The ROK actively initiated and was involved in technology transfer programmes on bilateral, regional and multilateral basis. For example, since the mid-1990s, the Korea International Cooperation Agency (KOICA) has provided energy conservation-related and forest management-related training programmes with other developing countries, such as China, Viet Nam, Nepal and Kazakhstan (Table 6.3). It also launched a series of bilateral technology cooperation with major countries, including Australia, China, and Japan, in the areas of renewable energy and fuel cells. The ROK participated in the USA-led Climate Technology Partnership to facilitate an energy auditing technique and energy service companies (ESCO) as well as methane recovery and utilisation technologies. In addition, the ROK has been playing an active role in technology cooperation at the regional level (e.g. APEC) and at the multilateral level (e.g. IEA).

<sup>1</sup> See para 57 of the report of the CDM EB at its 18th session (23-25 February 2005).

**Table 6.2 Major domestic climate policies**

	Issue	Policies and Measures
M I T I G A T I O N	Energy efficiency improvement	• Energy efficiency standards and labels
		• Minimum energy performance standards
	Promotion of renewable energy (RE) and other alternative energy	• Preferential purchase of the electricity produced by RE sources
		• Promotion of landfill gas recovery and use
		• Promotion of district-heating or gas heating system
		• Promotion of the combined heat and power (CHP) and waste-incineration heating
	Transportation	• Nuclear energy
• Supply of CNG buses		
Technology initiatives	• Promotion of alternative fuels for vehicles	
	• Clean coal technologies	
Other initiatives	• Domestic emissions trading scheme	
A D A P T A T I O N	Natural resources management	• Policies to support adaptation measures, such as cropping pattern change and varietal improvement
	Infrastructure management	• Policies to support assessment and countermeasures for the impact of sea-level rise on coastal zones • Reinforcement of disaster and disease prevention measures

**ROK contributed to international discussions on climate regime and proposed the concept of unilateral CDM.**

**Table 6.3 Status of KOICA training programmes**

KOICA training programmes on energy conservation & utilisation efficiency									
	1995	1996	1997	1998	1999	2000	2001	2002	Total
Country	11	9	10	9	14	14	14	11	42*
Number of Persons	21	18	18	17	20	19	19	31	163
KOICA training programmes on forestry management & desertification prevention									
Country	--	13	11	8	11	11	11	21	29*
Number of Persons	--	13	19	15	19	16	17	32	131

\* Overlapping countries are counted only once. Source: ROK's National Communication, 2003.

### 6.3 Assessment of the Current Climate Regime from the Korean Perspective

Participants in our consultations agreed that the entry into force of the Kyoto Protocol and launch of market-based mechanisms were major achievements of the current regime. As of October 2005, the ROK hosted five CDM projects which were either under or after the validation process. In our consultations, participants pointed out several problems of the current CDM: complexity of methodology; complex approval process, uncertainty, and adverse selection. Non-CO<sub>2</sub> CDM projects create more CER than CO<sub>2</sub> CDM projects, and also methodology for CO<sub>2</sub> CDM is much more complicated. As a result, CDM investments are prone to be concentrated on projects with low costs regardless of environmental benefits.

### 6.4 Major Concerns on the Current and Future Climate Regime

#### 6.4.1 Developmental concerns

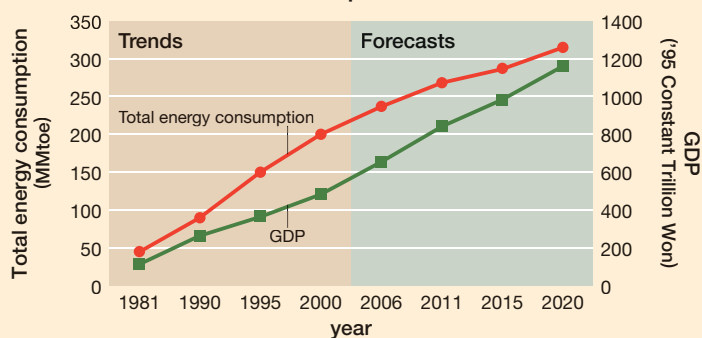
Related to economic development, the ROK has a keen interest in further economic growth and a major concern on energy security. At our consultation, policy priority for the economic development and energy issues, rather than climate policy itself, was observed. This is one of features in common with other developing countries of the region. Although the ROK has achieved rapid economic growth and industrialisation in the last few decades, it is still thirsty for growth (Fig. 6.2). While its primary energy consumption was estimated at 198.4 MMtoe in 2001, ranking it the tenth largest energy consuming nation in the world, it imported 97.2% of the total energy consumed (UNFCCC 2005g). Securing an energy supply and meeting growing demand for energy are major challenges. The ROK, therefore, has great concerns on how and to what extent climate change and the international climate regime will adversely affect the sources and supply of energy.

*ROK is concerned about its energy security and is unclear on how and to what extent climate change and international climate regime will adversely affect its sources and supply of energy.*

In addition, there was also a concern on the negative impact of additional climate measures on the competitiveness of its industry. The key industries of the ROK that have

contributed to its rapid economic growth are energy-intensive, including shipbuilding, steel, chemical, and oil refining industries. Other important industries, including semiconductors, electronics and auto manufacturing, also emit GHG directly or indirectly. The mining and manufacturing industries accounted for 39.1% of the Korea's total industrial structure (UNFCCC 2005g). Therefore, further mitigation policies are likely to have profound implications for these industries. While the importance of moving toward a low carbon society was generally recognised, it was not clear to many participants how and when the ROK could go in that direction.

Figure 6.2 Trends and forecasts for energy consumption and GDP in the Republic of Korea



Sources : Korea Energy Economics Institute 2002a, Korea Energy Economics Institute 2002b.

#### 6.4.2 Equity concerns

ROK's GHG emissions levels are roughly the same as those of Italy and Canada and its GHG emissions per capita have exceeded those of the EU and Japan. International pressure is mounting on the ROK to accept some form of GHG emissions control commitments in the future climate regime. The central concern of the ROK is how to design relevant commitments. Participants felt that it would be difficult for the ROK to agree to a fixed, quantified target of GHG mitigation at this stage, because unlike many Annex I countries with matured economies, the ROK still faces shifting economic situations and the difficulty in predicting future GHG emissions. Still, some other methods, such as a CO<sub>2</sub> intensity target and other types of dynamic targets that allow the economic growth in nature, might be worth examining (Kim and Baumert 2002).

**ROK is currently facing strong international pressure to accept some form of emissions reduction commitments.**

#### 6.4.3 Market-based mechanism-related concerns

It was argued that the eagerness for a unilateral CDM by the ROK was driven by incentives to bank CERs for the future (Zhang 2001). However, the participants in our consultation mentioned that the ROK government recently became reluctant to accept or push for unilateral CDM. ROK, as a member of the OECD, is currently facing international pressure to accept emissions reduction commitments. Furthermore, among the developing countries, the ROK already reached a relatively high level of energy efficiency, so that there are not many so-called "low-hanging fruits" left anymore.

#### 6.4.4 Technology-related concerns

With the growing concern on climate change, the R&D strategies have played a leading role in developing a less energy-intensive and environmentally-sound economic structure in the ROK. The promotion of new innovative technologies, including renewable energy, is considered along this line of strategy. However, the share of RE in the ROK accounted for just 1% of the total energy supply. Table 6.4 shows that the high cost of renewable energy and its low profitability is still a major obstacle to wider dissemination (Korea Energy Economics Institute 2002a). In particular, a key challenge is to develop integrated approaches for the research, development, and deployment of new and renewable energy technologies, introducing them to an increasingly liberalised market.

**Table 6.4 Cost of electricity-generating (won/kWh)**

Oil	Bituminous coal	Nuclear	Photovoltaics	Wind	Wastes
60	38	34	700	103	150

Source: Korea Energy Economics Institute, 2002a.

#### 6.4.5 Adaptation-related concerns

There is a growing interest in adaptation in the ROK. Indeed, the third NAP identified adaptation as one of the crucial issues. However, participants pointed out that that effective research on vulnerability assessment was limited in the ROK so far. The lack of policy-relevant information on the vulnerability to climate change, both at the global scale in general and the Korean Peninsula in particular, was seen as a major bottleneck to the formulation of appropriate adaptation policies. The Korea Environment Institute (KEI) has just started a three-year project on adaptation. Compared with the issues of industrial competitiveness and economic growth, it was felt that the ROK showed less interest on adaptation issues in general.

#### 6.4.6 Other concerns

Participants noted that the contribution of the ROK to the international scientific processes on climate change, particularly to the IPCC, was very limited. Measures for improving the international recognition of ROK scientists and experts were therefore considered crucial.

There were some discussions on the design of domestic climate policy. An optimal policy mix to reduce GHG emissions in a cost-effective way could include, for example, a domestic emissions trading scheme, the utilisation of the Kyoto mechanisms, and tax policies. However, still synergies between different policies were often lacking, and the assessment of policy impacts was considered inadequate.

### 6.5 Priorities for Restructuring the Climate Regime

#### 6.5.1 Market-based mechanisms

Related to the restructuring of the CDM, the following issues were pointed out:

- Technical capacity building for the current CDM scheme: The concepts of additionality and baseline-setting remain big challenges, so better guidelines and capacity-building for the Korean industry were considered vital to successful implementation of the CDM.
- Unilateral CDM: Unilateral CDM was initially thought to become a good incentive for the Korean industries (Kim 2000), but it is unclear whether unilateral CDM could be still attractive and favourable. In most developing countries, generally speaking, obstacles to a unilateral CDM are to secure financing of projects and buyers of CERs. For the ROK, however, the problem of getting project finance domestically may not be so serious. Unilateral CDM could also minimise transaction costs and it could be integrated into a national sustainable development strategy (Jahn, et al 2003). If the ROK finds an incentive to bank CERs for the future, a unilateral CDM can still be an attractive option.
- Policy-based CDM: The perspectives on policy-based CDM (Bosi and Ellis 2005) were mixed. On the one hand, it was considered that the baseline setting would be difficult, and that it could lead to an over-supply of CERs which would cause a decline in CER price. Without stricter rules, policy-based CDM would be more harmful than helpful. On the other hand, several participants argued for policy-based CDM, and even called for its implementation within the first commitment period on condition that stricter baseline criteria and screening process would be introduced. They argued that a market with only project-based CDM would have more problems than the case of policy-based CDM, and that the baseline issue should be resolved in either case.
- International financing mechanism: Participants suggested that a financing mechanism like the one created under the Montreal Protocol should be considered. Under such a financing mechanism, Annex-I countries could pool the money, purchase CERs and meet their commitments.

*Several ideas have been proposed to strengthen CDM in future climate regime.*

### 6.5.2 Technology issues

The role of technology in tackling climate change should be more explicitly emphasised in the future climate regime. The ROK spends a relatively large 3 per cent of the national income on R&D (OECD 2005) and has initiated a series of R&D projects to direct the Korean economy towards a less energy-intensive and more environmentally-sound structure. At the same time, the ROK is engaged in international cooperation to transfer technologies to other developing countries and partnerships with developed countries to develop innovative technologies. Participants felt that a technology-centred future climate regime would potentially benefit ROK, since it could have more opportunities for acquiring new innovative technologies from developed countries and deploying their technologies in other developing countries.

## 6.6 Epilogue

The ROK is currently facing international pressure on how to advance its future commitments. Several principles for future regime discussions should be considered. They are:

- First, the principle of common-but-differentiated responsibilities needs to continue in the future regime.
- Each country's national circumstances and concerns need to be incorporated in designing the future regime. Since nuclear energy has already become so important in terms of energy security, the ROK needs to appeal to the global community regarding the necessity of using nuclear options for meeting the energy needs of the future.
- Flexibility of the future climate regime should be enhanced, particularly for enabling the participation of developing countries.
- Sustainable development is a legitimate concern for everyone. The Asia-Pacific region has other urgent issues, like poverty alleviation and social development; the region, in general, is neither ready nor willing to work on the climate issue now. For the future regime to be successful, it should start from the sustainable development angle, rather than directly from climate concerns.
- Region-specific climate strategies in North-East Asia in particular should be considered as part of the international negotiations.

*The principle of common but differentiated responsibilities should continue to be the basis of future climate regime.*



# 7. VIET NAM

## 7.1 Introduction

*Since the introduction of “Doi Moi” (renovation) policy in 1986, Viet Nam has been experiencing high rates of economic growth leading to growing energy demands and GHG emissions.*

Viet Nam is known as a country of reform and integration with significant initial successes in socio-economic development, hunger eradication and poverty reduction (>50% reduction between 1990 and 2000) under the “Doi Moi” (renovation) policy introduced in 1986. Viet Nam has been experiencing a consistently high rate of economic growth since then. For example, its GDP growth rate marked 7.2% in 2003 and 7.5% in 2004 (Table 1). However, it still faces many challenges given that its GNI per capita is only US\$550 per annum and 17.7% of its population live on a daily income of US\$1.

High rates of economic growth in Viet Nam led to growing energy demands and GHG emissions. Viet Nam historically relied on hydro-power for electricity. In 2002, for example, hydro-power contributed to 60% of the total electricity generated. Viet Nam is the third largest oil producer in Asia with crude oil production averaging about 403,300 barrels per day (bbl/d) in 2004. Further, it has proven gas reserves of 6.8 trillion cubic feet. Viet Nam has significant coal reserves estimated at 165 million tons, the majority of which is anthracite (EIA 2004). It also has significant uranium reserves. Therefore, Viet Nam has promoted the construction of coal-fired power plants and is now planning to construct a 2000 MW nuclear power plant by 2020 in cooperation with Japan, France, Russia, the

Republic of Korea, and others. Viet Nam’s industries are primarily dependent on domestic coal, oil and gas, while much of the population relies on non-commercial biomass energy, such as wood and rice husk. Indeed, due to years of war and the overdependence on fuel wood, Viet Nam’s forest coverage decreased from 43% in 1943 to 28% in 1994. The socio-economic development plans of 2001-2005, and 2006-2010, therefore, set targets of forest coverage of 38 and 43% respectively.

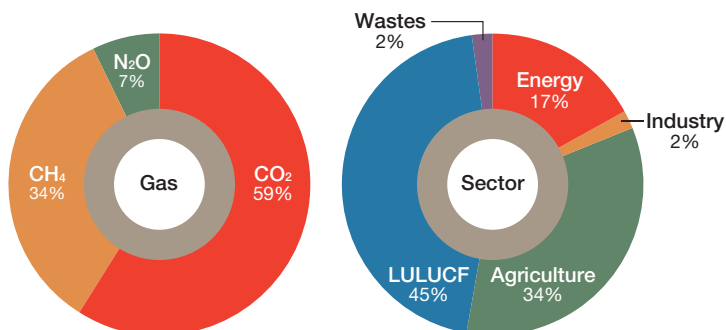
Viet Nam’s initial National Communication, stated that the counting emitted 154,160Gg CO<sub>2</sub> equivalent (CO<sub>2</sub>-eq) of GHG (excluding 50,327Gg CO<sub>2</sub> removal by LULUCF) in 1994 with CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O accounting for 60%, 34% and 6%, respectively. The main sources of GHG were forest degradation (45%), followed by agriculture (34%) and energy sectors (17%) (Fig. 7.1). Total GHG emissions are projected to increase from about net emissions of 104 million Mt CO<sub>2</sub>e in 1994 to about 233 million Mt CO<sub>2</sub>e (Fig. 7.2).

**Table 7.1 Key Statistics for Viet Nam**

Population (2004)	82.2 million	
Annual Population Growth (2004)	1.04%	
GDP (Current US\$) (2004)	US\$ 45.2 billion	
GDP per capita (2004)		
Current US\$ (2004)	US\$550	
Purchasing Power Parity (2004)	US\$2,704	
GNI per capita (Atlas Method) (2004)		
Current US\$ (2004)	US\$550	
Purchasing Power Parity (2004)	US\$2,700	
Annual GDP growth (2004)	7.50%	
Energy demand (2002)	43 million Mtoe	
Per capita energy consumption (2002)	530.25 kgoe	
Per capita electricity consumption (2002)	373.87 kWh	
Energy mix (2002)	Combustible, renewable and waste	55%
	Oil	24%
	Coal	13%
	Gas	5%
	Hydro	4%
GHG Emissions (1994)	154 million MtCO <sub>2</sub> e	
GHG Emissions per capita (2000)	1.66 MtCO <sub>2</sub> e	
CO <sub>2</sub> Emissions (1994)	91 million MtCO <sub>2</sub>	
CO <sub>2</sub> Emissions per capita (2000)	0.73 MtCO <sub>2</sub>	
CO <sub>2</sub> Emissions per GDP (2000)	1.84 kg/US\$	
Forest area	38 % of Land	

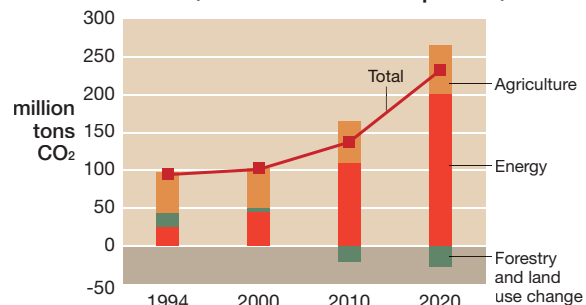
Sources: UNFCCC (2005g), World Bank (2005), IEA (2005)

**Figure 7.1 Distribution of GHG emissions from Viet Nam in 1994 by gas and sector**



Source: UNFCCC (2005g)

**Figure 7.2 Estimated GHG emissions to 2020 (in million tons of CO<sub>2</sub> equivalent)**



Source: UNFCCC (2005g)

## 7.2 Major Domestic Climate Policies and International Contributions

Table 7.2 lists selected policies and measures aimed at GHG mitigation and adaptation to climate change.

**Table 7.2 Selected domestic policies and measures in Viet Nam**

	Area/Issue	Policies and measures
M I T I G A T I O N	Energy efficiency improvement	<ul style="list-style-type: none"> <li>Replacement of low-efficient coal/oil fired boilers.</li> <li>Efficiency improvement of coal cooking stoves.</li> </ul>
	Promotion of renewable energy	<ul style="list-style-type: none"> <li>Renewable Energy Action Plan to develop geothermal, solar, wind and nuclear power.</li> <li>Setting up biogas plants and stoves in rural areas.</li> </ul>
	Transportation	<ul style="list-style-type: none"> <li>Fuel efficiency improvement with lean burn engine in transportation.</li> </ul>
	Carbon Sequestration	<ul style="list-style-type: none"> <li>Active protection of forests including national reserve gardens, rare wood forests, watershed protective forests, important reserves.</li> <li>Restoration of special protective forests.</li> </ul>
	Other initiatives	<ul style="list-style-type: none"> <li>Water management policies in rice fields.</li> <li>Provision of processed feed for animals.</li> </ul>
A D A P T A T I O N	Natural resource management	<ul style="list-style-type: none"> <li>Afforestation and reforestation policies in watersheds.</li> <li>Development of cropping patterns, new varieties and techniques to adapt to climate change.</li> <li>Effective use of irrigation water and upgrading of irrigation systems.</li> </ul>
	Infrastructure management	<ul style="list-style-type: none"> <li>Upgrading and new construction of sea and river mouth dykes and rising level of drainage system.</li> </ul>
	Other initiatives	<ul style="list-style-type: none"> <li>Developing national plan and programme for health control and monitoring.</li> </ul>

Source: UNFCCC (2005g)

***Viet Nam's policies to mitigate GHG emissions in the energy sector were mainly focused on energy efficiency and renewable energy through implementation of a decade long Renewable Energy Action Plan of 1999.***

### **7.2.1 Mitigation policies**

Viet Nam's policies to mitigate GHG emissions in the energy sector were mainly focussed on energy efficiency and renewable energy through implementation of the 10-year Renewable Energy Action Plan of 1999 (Australian Business Council for Sustainable Energy (BCSE) 2005). Several policies were adopted to improve efficiency of coal energy use and develop nuclear energy. In the forest sector, several forest protection and afforestation policies were being implemented with the goal to increase the coverage of forestland by 43%. In the agricultural sector, CH<sub>4</sub> mitigation measures through improved soil, crop, water and fertiliser management were being encouraged.

### **7.2.2 Adaptation initiatives**

Viet Nam is located in the downstream from two large international rivers: the Mekong and the Red River. The large delta areas of those rivers are less than one meter above the mean sea level and some is even below sea level. Therefore, vulnerability of Viet Nam to impacts of climate change need not be overstated (Granich et al 2003). Viet Nam introduced measures to prevent soil salinisation and flooding by constructing sea dykes and drainage systems. As food security is one of the top priorities to alleviate poverty, Viet Nam needs to further upgrade its drainage systems and construct new sea dykes. Policies for increasing the forest coverage in watersheds can also contribute to the improvement of adaptive capacity of local communities and to minimise losses from natural disasters associated with climate change (Tri et al 1996).

### **7.2.3 International contributions**

Viet Nam ratified the UNFCCC in November 1994 and the Kyoto Protocol in September 2002. The Ministry of Natural Resources and Environment (MONRE) was designated as a National Focal Agency to the Convention and the DNA of the CDM. Viet Nam prepared the initial National Communication (VINC) with the support of UNEP/GEF and submitted it to the UNFCCC in 2003. The DNA was established in 2003, and the UNEP-RISO is supporting the development of its capacity under the CD4CDM programme.

## **7.3 Assessment of the Climate Regime from Viet Nam's Perspective**

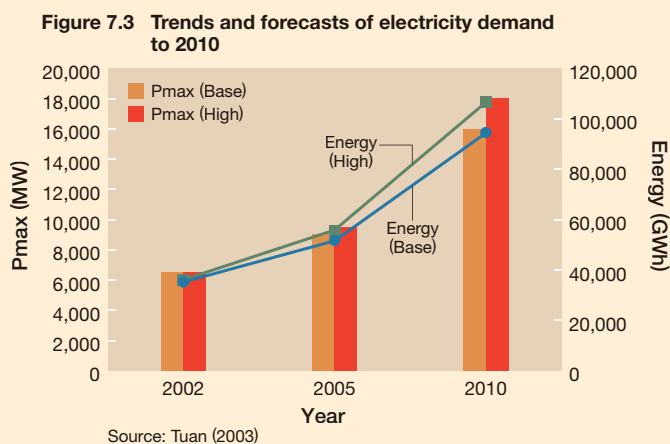
Most participants of our consultations in Viet Nam noted that the current climate regime is the first positive step to addressing the challenge of climate change. They recognised that the entry into force of the Kyoto Protocol and the establishment of market-based mechanisms, such as the CDM, are significant achievements of the current regime. For example, the CDM is recognised as a good tool to facilitate private investment in renewable energy and rural area development as well as afforestation and reforestation. However, they noted that improvements in various elements, including market-based mechanisms, technology transfer and adaptation, would be crucial to strengthening the future climate regime. The concerns related to various elements of the climate regime and the options to improve them are discussed in the following sections.

## 7.4 Major Concerns on the Current and Future Climate Regime

### 7.4.1 Developmental and economic concerns

The UNDP placed Viet Nam at a level of “medium human development” and ranked it 108 on the list of 183 countries (UNDP 2005). Most participants agreed that economic growth and poverty alleviation should be high priorities for Viet Nam but they recognised that GHG mitigation and adaptation should receive more policy attention in future. To do so, they recognised the necessity of improving awareness of policy-makers on climate change. Considering the fact that a significant proportion of the population is poor, Viet Nam set an annual economic growth target of 8% to reach a GDP per capita of US\$1000 by 2010. Such a growth rate, however, will in turn enhance energy demand. For example, Tuan (2003) reported that the demand for electricity is projected to increase by nearly three-fold from 2002 to 2010, with significant implications for GHG emissions for the country (Fig. 7.3). How to meet growing energy demands to sustain development without significant increases in GHG emissions is a major concern for Viet Nam.

*Most participants recognised that GHG mitigation and adaptation should receive more policy attention in future.*



### 7.4.2 Equity concerns

The participants noted that high disparities in per capita emissions both within and among nations were a major concern. Viet Nam's per capita GHG emissions are very low at present (Table 7.1) but they noted the need to conduct studies on the potential economic impacts of various GHG mitigation and adaptation measures. They also considered that Annex I countries should commit to further reduction of GHG emissions and some of advanced developing countries should commit to reducing GHG emissions in the future.

### 7.4.3 Market-based mechanisms-related concerns

The limited progress in the CDM implementation in Viet Nam was a major problem expressed by several participants in our consultations. Although Viet Nam established the CDM National Executive and Consultation Board (CNECB) in 2004 and set up its mid-term plan for the CDM by 2008 in order to develop the capacity for CDM implementation, the number of CDM activities to date is quite limited. Only one methodology from the country was approved by the CDM methodology panel but the project was not submitted yet for registration by the CDM-EB. As of October 2005, four projects are in

*The uncertainty of the validity of CERs generated after the first commitment period was noted as one of the reasons for difficulties in raising underlying finance for CDM projects.*

the approval process at Viet Nam's DNA and sixteen projects are under development (Hieu 2005). Participants noted that the complexity of the CDM procedures, including the long approval process both within and outside the country, was a major barrier. Although many workshops on CDM implementation and methodologies took place, it is still hard for local project developers, including small and medium-scale enterprises, to understand the modalities and procedures for the CDM. Furthermore, the participants highlighted difficulties in raising underlying finance for CDM projects due to their low rates of return on investments. The uncertainty of the validity of the CERs generated after the first commitment period was noted as one of the reasons for difficulties in raising the underlying finances for CDM projects, especially those related to afforestation and reforestation. The lack of attention by international investors to support small-scale CDM projects in rural areas and renewable energy projects was also identified as a major concern.

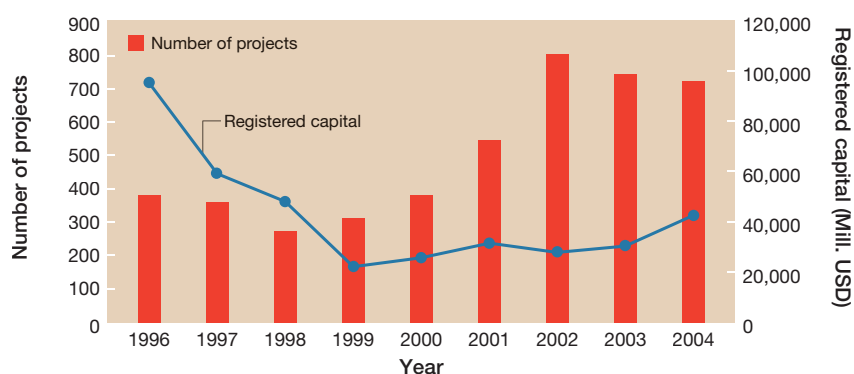
#### **7.4.4 Technology development and transfer-related concerns**

Most participants expressed concern about the level of technology development and transfer to address climate change in Viet Nam. Indeed, the technology diffusion level in the country is rather low. Viet Nam ranked 102 among 162 countries in the Technology Diffusion Index (UNDP 2001). The lack of comprehensive technology needs assessment to determine GHG mitigation technologies which are suitable for Viet Nam's economic and social conditions and developmental needs was also identified as a major concern. Considering its renewable resource potential and coal reserves, clean coal and renewable energy technologies might be most appropriate for Viet Nam. However, participants noted that the current climate regime failed to create a suitable incentive structure for the development of renewable sources of energy. The participants noted that even developing countries could commit to reducing GHG emissions if they have the necessary technologies and financial resources, and highlighted that incentives for the transfer of technologies from developed countries should be considered.

#### **7.4.5 Capacity-building concerns**

The majority of the participants expressed a strong concern regarding Viet Nam's capacity to address climate change. First, the lack of research capacity within the country and inadequate and inconsistent support from developed countries to undertake country-specific and/or country-relevant research were identified as significant issues for attention. Secondly, the lack of negotiation capacity was identified as a barrier to convey Viet Nam's concerns on climate regime to international community. Although Viet Nam received capacity-building support for establishment of DNA (for example through UNEP-RISO's CD4CDM programme), and preparation of initial National Communication from several kinds of sources, participants felt that such efforts were inadequate. Thirdly, the low capacity of the private sector to implement CDM activities was considered an important issue. Some participants noted that the lack of capacity to improve the legal framework and create an incentive structure for foreign investment was hindering CDM activities in Viet Nam, although CDM is expected to facilitate an inflow of FDI which level is gradually recovering. (Fig 7.4)

**Figure 7.4 Foreign direct investment projects licensed from 1988 to 2004**



Source: General Statistics Office of Viet Nam

### 7.4.6 Adaptation concerns

Considering the fact that the main rice fields of Viet Nam are in the Mekong and Red River deltas, which are highly vulnerable to climate change, the participants noted that Viet Nam was strongly concerned about adaptation. Although the government implemented some measures to mitigate the impacts from typhoon, flood and salinisation, the participants noted that such measures are far from adequate to address the challenges. Smith (1997) suggests the necessity of the priority setting for adaptation measures. As for the international climate regime, the participants felt that adaptation has not receive much attention to date and that financial measures to support adaptation were inadequate and sometimes inappropriate.

## 7.5 Priorities for Restructuring the Future Climate Regime

### 7.5.1 Development and equity

As the topmost priority for Viet Nam is development, the participants at our consultations recommended that climate policies must be framed in developmental terms, rather than purely from the point of environmental concerns. On a national level, Dang et al. (2003) noted the importance of designing a domestic, harmonious and realistic strategy to combat climate change that combines both mitigation and adaptation at the national level. At the international level, the participants noted that the future regime discussions must expand the options for mainstreaming climate concerns in developmental programmes, including the creation of additional market-based mechanisms. Some participants argued that advanced developing countries should begin to reduce their GHG emissions growth more proactively than before.

***The need for preferential support for community-based CDM projects (biogas utilization, energy conservation, waste management, etc.) was emphasised.***

### **7.5.2 Market-based mechanisms**

Several participants noted that Viet Nam's high expectations for the CDM as a basis for financing development projects with technology transfer were not realised due to various barriers. They urged that the future climate regime discussions should focus on streamlining the CDM procedures to reduce transaction costs and that all projects that aim to develop renewable resources must be made eligible for the CDM. The need for preferential support for community-based CDM projects (biogas utilisation, energy conservation, waste management, etc.) was also noted as such projects will have direct positive impacts on poverty alleviation, development of rural infrastructure, and increased awareness of rural communities on ways to reduce GHG emissions. Participants noted that it is important to develop additional CDM methodologies focussing on small-scale CDM activities in rural areas, and that removing uncertainty of the validity of CERs generated after 2012 would greatly help the implementation of long-term sustainable projects such as afforestation and reforestation. The latter is especially relevant for Viet Nam, which aims to increase forest coverage from the current 28% to 43%. The participants suggested that Annex I countries should consider establishing a financing programme to cover the underlying finance of CDM projects with large sustainable development benefits. At the national level, participants noted the need for streamlining approval procedures and for conducting cost-benefit analysis of CDM projects.

### **7.5.3 Technology development and transfer**

From Viet Nam's perspective, facilitation of technology transfer is one of the key features for restructuring the future climate change regime. As stated earlier, the government plans to develop coal-based, renewable energy-based and nuclear power plants to meet the increasing energy demands. The participants, therefore, suggested that discussions must focus on ways to transfer clean coal and other advanced technologies from developed to developing countries. Considering the high vulnerability of Viet Nam to impacts of climate change, especially sea level rise, the participants noted the need for the transfer of technologies to facilitate adaptation.

### **7.5.4 Capacity-building**

The participants argued that future regime discussions must explore new ways of enhancing the capacity of developing country stakeholders, especially in negotiation, technology and research. While association with major groups such as "G77+China" was considered a useful strategy to increase negotiation capacity of countries such as Viet Nam, some participants felt that they do not necessarily represent Viet Nam's concerns and priorities due to a large number of countries. The participants also noted that building capacity of the private sector in CDM implementation is crucial to achieve reduction in GHG emissions and that research capacity to assess local impacts of climate change is necessary to design appropriate adaptation strategies reflecting both national and local circumstances.

### 7.5.5 Adaptation

Current mechanisms for facilitating adaptation both at national and international levels were considered to be inadequate by many participants. On the national level, participants recognised the need for mainstreaming adaptation concerns in developmental policies and programmes. In this process, however, economic structural causes of vulnerability in different regions must be carefully examined (Adger, 1998, 1999 and 2000). At the international level, the participants argued that future regime discussions should lead to the development of mechanisms to support adaptation in terms of funding, technology and policy implementation. Some participants suggested that the creation of a new institutional framework, such as an adaptation protocol with specific targets, could be useful for countries such as Viet Nam, if it facilitates: (a) development of short- and long-term adaptation policies, (b) the assessment of necessary technologies for adaptation, and (c) financial assistance for adaptation. Target-setting for adaptation was considered crucial as it would allow determining the extent of adaptation measures to be undertaken by different groups of stakeholders (national and local governments, and local communities). Some participants noted that discussions should facilitate ways to share information on the tools and technologies for facilitating adaptation, and to find synergies between strategies of mitigation and adaptation (Dang et al 2003).

*Current mechanisms for facilitating adaptation both at national and international levels are considered to be inadequate.*

## 7.6 Epilogue

Our consultations helped us identify various concerns and interests of Viet Nam in relation to the future climate regime. The concerns mainly include various development issues like poverty alleviation energy security, food security, and forest conservation. At the same time, many participants recognised that climate change is a serious threat that cannot be ignored and that substantial domestic efforts are necessary in both mitigation and adaptation. It is, therefore, important for policy-makers and negotiators from Viet Nam to bring their concerns into international discussions more proactively than before. Several ideas were proposed to strengthen the future climate regime especially with regard to the CDM and adaptation. We believe that the implementation of such ideas, both at domestic and international levels, can lead to the realisation of the vast potential for development that Viet Nam holds in this century.



## 8. REST OF ASIA-PACIFIC

The previous chapters (2-7) summarised the findings of our consultations held in China, India, Indonesia, Japan, Republic of Korea and Viet Nam. As we could not organise such consultations in each of the rest of Asia-Pacific countries due to resource limitations, we organised a region-wide consultation in conjunction with the 14th Asia-Pacific Seminar on Climate Change held in Yokohama, Japan. This chapter summarises the outcomes of the region-wide consultation with special focus on countries that were not covered in previous chapters.

### 8.1 Introduction

For the convenience of the readers, key statistics of selected countries representing ASEAN, Least Developed Countries (LDCs) and Pacific Island Countries (PIC) groups in the region were presented in Table 8.1. In most countries, poverty alleviation and economic

development are main priorities, as significant proportion of population in several countries is below the poverty line. Most of the countries do not emit much GHG (Figure 8.1), but their emissions are expected to grow in the near future (e.g., by 9.0% in Mongolia, 9.8% in the Philippines, 32% in Thailand between 1990 and 2020 (ALGAS 1998). The unprecedented economic and population growth rates in several countries, especially in South-east Asia, over the past two decades contributed significantly to the increases in energy use and GHG emissions (Mendelsohn 2003).

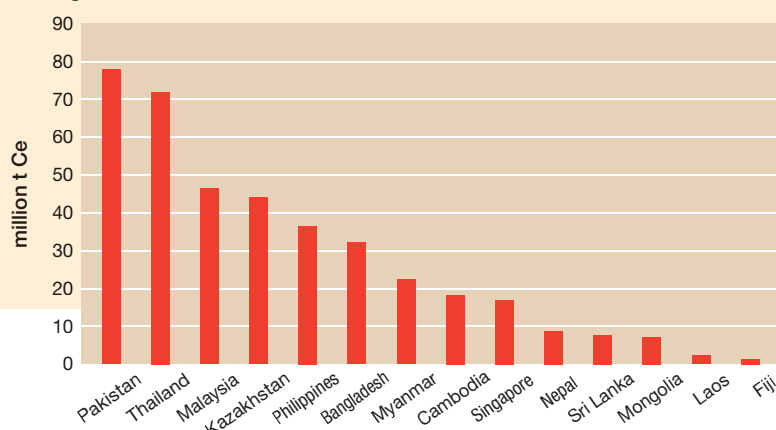
**Table 8.1 Key statistics in selected countries**

Country	Population (million) (2004)	Poverty rate below \$2 a day (%)	GDP growth rate (2004)	CO <sub>2</sub> emissions (million MtCO <sub>2</sub> ) (2000)	CO <sub>2</sub> emissions (kg per 2000 PPP \$ of GDP)(2002)	Energy use per capita (kgoe)(2002)
<b>ASEAN</b>						
Malaysia	25.2	9.3	7.1	144.4	0.69	2,129
Philippines	83.0	47.5	6.2	77.5	0.25	525
Thailand	62.4	32.5	6.1	198.6	0.52	1,353
<b>LDCs</b>						
Bangladesh	140.5	82.8	5.5	29.3	0.15	155
Cambodia	13.6	77.7	6.0	0.5	0.02	–
Nepal	25.2	80.9	3.7	3.4	0.11	353
<b>PIC</b>						
Cook Islands	0.017	–	3.4	0.0	–	–
Fiji	0.8	–	3.8	0.7	0.18	573 (2001)
Solomon Islands	0.5	–	3.8	0.2	0.21	127 (2001)

Sources: World Bank (2005), WRI (2005), UNFCCC (2005g), UNDP (2005a)

Note: Data of poverty rate below \$2 a day refers to most recent year available during 1990-2003.

**Figure 8.1 Total GHG emissions in selected countries**



Source: WRI (2005)

Note: HFC & SF<sub>6</sub> data of Fiji is not available.

## 8.2 Domestic Climate Policies and International Contributions

Table 8.2 shows major domestic climate policies on mitigation and adaptation in selected countries. Economic instruments seem to play a major role compared with regulatory measures.

**Table 8.2 Domestic climate policies in selected countries of the Asia-Pacific region**

	Issue	Policies and Measures
M I T I G A T I O N	Energy efficiency improvement	<ul style="list-style-type: none"> <li>• Voluntary green labelling scheme for electric appliances (Singapore)</li> <li>• Technical assistance and financial grants to adopt energy-efficient technologies and equipments (Singapore)</li> <li>• Promotion of more efficient use of energy (Thailand)</li> </ul>
	Promotion of renewable energy	<ul style="list-style-type: none"> <li>• Mini-hydropower and photovoltaic solar systems (Mongolia)</li> <li>• Tax duty redemption or reduction, investment, and commitment to the Green IPPs (1999-2008) (Philippines)</li> <li>• Use of 1% coco-biodiesel for all government vehicles (Philippines)</li> <li>• Energy conservation law of 1992 mandates renewable energy Small Power Producers' Programme with power purchase, price assurances and subsidies (Thailand)</li> </ul>
	Transportation	<ul style="list-style-type: none"> <li>• Additional registration fee/ Electronic Road Pricing (ERP) (Singapore)</li> </ul>
	Carbon sequestration	<ul style="list-style-type: none"> <li>• Forestry Law in 2002 and Draft Community Forestry Sub-Decree in 2003 (Cambodia)</li> </ul>
	Technology initiatives	<ul style="list-style-type: none"> <li>• Dissemination of energy conservation technologies (Thailand)</li> </ul>
A D A P T A T I O N	Natural resources management	<ul style="list-style-type: none"> <li>• Subsidy for the revival of traditional agriculture to strengthen adaptation capacity (Kiribati)</li> <li>• Soil and water conservation programmes (Philippines, Pakistan)</li> <li>• Afforestation to prevent landslides and conserve water (Nepal)</li> </ul>
	Infrastructure management	<ul style="list-style-type: none"> <li>• National Adaptation Program (Kiribati)</li> <li>• Ban on commercial exploitation of mangroves (Micronesia)</li> <li>• Construction of cyclone shelters and embankments (Bangladesh)</li> </ul>
	Others	<ul style="list-style-type: none"> <li>• Cyclone Warning System (Cook Islands)</li> </ul>

Sources: UNFCCC (2005g), OECC (2004)

Despite their keen interest in contributing to international negotiations, most PIC, ASEAN and LDCs in the region did not play a leading role largely due to the lack of domestic capacity to send enough negotiators to the COPs. The number of NGOs in Asia that can support international negotiations is also limited. Out of 591 NGOs with observer status at the UNFCCC, there are only three from Malaysia, two from Bangladesh, and one each from Thailand, and Pakistan (UNFCCC 2005a).

*Most countries in the region have not played a leading role in international negotiations.*

## 8.3 Assessment of the Current Climate Regime

A wide diversity of interests can be noted in the region, and such interests reflect upon their perceptions on the current climate regime. In general, ASEAN member states are interested in international competitiveness, LDCs in poverty alleviation, and PIC in adaptation.

*Participants from Thailand, Cambodia and the Philippines positively assessed the support from Annex I countries in capacity-building for the CDM and noted that such efforts could also lead to good governance in developing countries.*

### **8.3.1 Progress achieved to date**

The entry into force of the Kyoto Protocol and the establishment of market-based mechanisms were considered to be the main achievements of the current regime. As of October 2005, most countries, except Singapore, either ratified or were about to ratify the Kyoto Protocol (UNFCCC 2005e). Several participants noted that preparation of National Communications, including GHG inventories, was a positive feature of the current regime. However, it was emphasised that international support for the preparation of the National Communications and implementation of actions thereafter was far from satisfactory. Participants from Thailand, Cambodia and the Philippines positively assessed the support from Annex I countries in capacity-building for the CDM and noted that such efforts could also lead to good governance in developing countries. Although the progress of the CDM is quite slow, many countries have begun making national strategies to implement the CDM. As of October 2005, most countries in Asia, except Myanmar, established their DNAs. In the Pacific sub-region, however, most countries except Fiji did not establish a DNA yet, reflecting their low interest in the CDM (UNFCCC 2005c).

### **8.3.2 Challenges for the future**

The participants noted that GHG mitigation is a challenge for all countries and especially for developing countries. Further engagement of civil society and the business community in climate initiatives remains a big challenge, although several countries include NGOs in their DNA membership to ensure that the proposed CDM projects adequately accommodate the genuine concerns of the stakeholders. Promoting public awareness of climate change at the local level was also emphasised as a challenge. The implementation of the CDM to realise sustainable development, facilitation and implementation of adaptation strategies, and address equity issues based on the principle of “common but differentiated responsibilities” are other challenges. Some participants (e.g., Malaysia) noted that the identification of mechanisms to enable technology transfer, such as the CDM, are another future challenge .

## **8.4 Major Concerns on Current and Future Climate Regime**

*In most countries of the region, integration of climate change concerns into social and economic policies is still at an embryonic stage.*

Most participants recognised that the current climate change regime does not reflect the major concerns of developing countries in the region, since international negotiations have been largely initiated by developed countries. In addition, participants felt that no particular efforts were made yet to find out the specific concerns and interests of each developing country.

### **8.4.1 Developmental and economic concerns**

Low policy priority of climate change and lack of integration of climate change in national development plans were identified as major concerns by participants from several countries (e.g., Cambodia and the Philippines). The process of integrating climate change concerns into social and economic policies and plans is still at an embryonic stage (UNFCCC 2005g). How to meet the growing energy demands to sustain economic development without adverse impacts on the environment is a major concern of several countries (e.g., the Philippines and Malaysia). In most countries, policies for promotion of

alternate sources of energy (e.g., renewable sources) exist but current energy demands cannot be met by such alternate sources. The relatively low levels of energy efficiency were also a point of concern for most countries in the region. For example, the Philippines, Singapore and Thailand, are often cited as the three most inefficient energy users among the East Asian export-oriented economies (Lian 2005). The lack of attention to climate change at the sub-regional level was also a point of concern. Despite the presence of the ASEAN Climate Change Secretariat (in Jakarta), no substantial progress in discussions on climate change was made among ASEAN countries.

#### **8.4.2 Equity concerns**

Most participants recognised that equity issues were not adequately reflected in the current regime. Indeed, along with poverty, equity is one of the most important human concerns which interact with both sustainable development and climate change in a complex way (Munasinghe 2002). Some participants (e.g., Malaysia) emphasised that the principle of “common but differentiated responsibilities” should continue to be the basis of future regime discussions. There is also a concern on burden-sharing of GHG mitigation and the lack of demonstrable progress by Annex I countries. Participants noted that developed countries, which possess greater capacity to respond to climate change, should bear a larger share of the burden (Banuri and Spanger 2002) and lead in mitigation efforts.

#### **8.4.3 Technology development and transfer-related concerns**

Many participants (e.g., the Philippines, Malaysia, Pakistan, Cook Islands) noted that the implementation of technology transfer under the current regime was not satisfactory in meeting the development demands and needs of developing countries (Shrestha 2004). Even after the introduction of some technologies, several restrictions were imposed on such technologies. For example, out of total 523 technologies introduced into Thailand, 53.5% had restrictions on transferred technologies (Chantanokome 2003). Concerns about the lack of wide and appropriate dissemination means for energy efficiency technologies, the lack of access to the right technologies at an affordable price, IPR restrictions related to publicly-owned technologies, and the lack of necessary funding to acquire technologies were also mentioned. In PIC (e.g., Cook Islands), it was pointed out that technology transfer in renewable energy and energy efficiency areas was done on a small-scale basis, but it was not disseminated widely. The lack of suitability and applicability of transferred technologies and high cost of renewable energy technologies were also identified as the major concerns.

#### **8.4.4 CDM-related concerns**

All participants considered that the CDM is a useful concept, but there were a number of institutional, technical, financial and legal barriers to implement the CDM in developing countries (Shrestha 2004, Philibert 2004). Participants felt that the original goal of promoting sustainable development through the CDM is not yet realised due to such barriers. Furthermore, there was also a concern about the poor geographic representation of current CDM (Lecocq and Capoor 2005). For example, out of total thirty-three registered CDM projects as of 5 November 2005, there were no projects from the entire ASEAN sub-region. Likewise, out of thirteen Asian LDCs, only two projects (one each from

*Participants expressed concerns about burden-sharing of GHG mitigation and the lack of demonstrable progress by Annex I countries.*

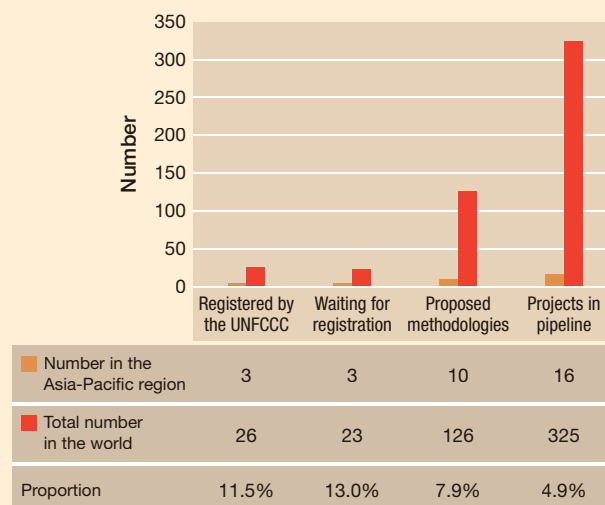
*The lack of suitability and applicability of transferred technologies, and high cost of renewable energy technologies are major barriers in many countries of the region.*

**Current CDM is favouring largely low-cost projects without much benefit in terms of sustainable development.**

Bangladesh and Bhutan) were registered. Only one project from the entire Pacific region (from Fiji) was registered. It must be noted, however, that among the 325 projects in the pipeline, there are six from the Philippines, four from Malaysia, three from Thailand, two from Nepal, and one from Cambodia (Figure 8.2).

A concern was also expressed that the current CDM was favouring largely low-cost projects without many benefits in terms of sustainable development. For example, twelve large-scale CDM projects, such as HFC23 and landfill gas recovery, generate nearly 95% of CERs (UNFCCC 2005b). Rigid institutional structure of the CDM-EB and lack of streamlined procedures were also identified as a major concern. Many countries (e.g., Malaysia, Thailand, and the Philippines) expressed concern regarding uncertainty in continuity of the CDM beyond 2012. Participants noted that such uncertainty and lack of consensus about the post-2012 process could be a major barrier for the promotion of national strategies to implement the CDM. The low price of CERs of 4-6 Euros as against about 20-25 Euros for EAU under EU ETS (Lecocq and Capoor 2005) was also a point of concern. PIC expressed concern that their geographic isolation is a major barrier in attracting CDM investors to the region.

**Figure 8.2 Status of the CDM activities in the Asia-Pacific region (except China, India, Indonesia, Republic of Korea and Viet Nam) as of 20 October 2005**



Source: UNFCCC (2005b)

#### 8.4.5 Negotiation-related concerns

Several countries in the region (e.g., Cambodia, Malaysia and Cook Islands) expressed a concern regarding the low number of negotiators sent from their countries to the UNFCCC. The Cook Islands, for example, recently reduced the number of negotiators from two to one due to reduced support by the UNFCCC for participation. In order to overcome such limitations as well as their limited negotiation capacity, many developing countries in the region tried to maximise their influence through groups such as "G77+China" or "Alliance of Small Island States (AOSIS)" (Mwandosya 2000). However, integrating diverse opinions of countries in the group and make a single position is a concern, since LDCs and PIC are often marginalised in the decision-making process of "G77+China" (Grubb et al 1999). The capacity of negotiators and lack of information on negotiation were also identified as points of concern.

#### 8.4.6 Adaptation-related concerns

The participants noted that very limited attention was paid to adaptation in the current regime, even though there is clear evidence that poorer nations and disadvantaged groups within nations are especially vulnerable to climate change (UNDP 2003). Inadequate attention to adaptation in national development plans was also a concern expressed by several countries (e.g., Cambodia). Frustration about the slow progress in discussions on adaptation was widely echoed by the participants. Some participants expressed a concern that adaptation might not attract the interest of Annex I countries due to several uncertainties associated with the vulnerability and adaptation assessment.

*Frustration about the slow progress in international discussions on adaptation was widely echoed by participants.*

#### 8.4.7 Financing-related concerns

Inadequate funding and lack of progress by Annex I countries in implementing their financial commitments was noted as a major concern. For instance, only 13.5% of total pledge to GEF has been met in 2005 (GEF 2002). Concern was also expressed on the functioning of the GEF as guidelines for accessing GEF funds were often complicated and sometimes confusing (Murdiyarsa 2004). The performance of funding mechanisms, such as Special Climate Change Fund (SCCF) and the Least Developed Countries Fund (LDCF), was considered unsatisfactory. The decreasing trend of ODA as a share of the GNI from 0.5% in 1960 to 0.22% in 1997 (UNDP 2005a) was also identified as a concern, especially for LDCs and PIC which depend much on ODA for their development. There was a diversity of views on utilising ODA for CDM. While some participants (e.g., Malaysia, Cook Islands) expressed a concern on possible diversion of ODA to acquire CERs by Annex I parties, others were open to the possibility of using ODA for underlying project finance or enabling environment to implement the CDM. Many participants agreed that the current 2% share of the CDM proceeds to support adaptation is not adequate.

*Participants were concerned about the functioning of the GEF as guidelines for accessing GEF funds were often complicated and sometimes confusing.*

#### 8.4.8 Other concerns

Participants noted that unsustainable lifestyles of developed countries and raising fuel prices would become a concern for energy security in the Asia-Pacific with widespread implications for GHG emissions from the region.

### 8.5 Priorities for Restructuring Climate Regime

In our consultations, possible features of a future climate change regime, such as the reform of the CDM, measures to support adaptation, technology development and transfer, financing, capacity-building and other issues (e.g., capacity of negotiators, ODA for the CDM and adaptation) were discussed. A few ideas have been suggested for strengthening the climate regime (Table 8.3).

*Several priorities for restructuring the future climate regime were proposed.*

**Table 8.3 Priorities for restructuring the future climate regime**

Theme	Options for restructuring
1. Market Mechanisms	<ul style="list-style-type: none"> <li>• Expansion of the demand for post-2012 CER through creation of CER funds</li> <li>• streamlining the additionality requirement for CDM projects</li> <li>• Simplification of CDM-EB procedures</li> <li>• Preferential treatment of projects with sustainable development</li> <li>• Creation of incentives for active involvement of Annex B countries</li> </ul>
2. Adaptation	<ul style="list-style-type: none"> <li>• Increasing the share of CDM proceeds to the Adaptation Fund</li> <li>• Mainstreaming adaptation into national development plans</li> </ul>
3. Technology transfer	<ul style="list-style-type: none"> <li>• Innovative financing options for technology development and transfer</li> <li>• Synergies with other technologies to provide business incentives (co-benefits)</li> <li>• Promotion of private-private partnerships across the countries</li> <li>• Promotion of South-South technology transfer</li> </ul>
4. Financial assistance	<ul style="list-style-type: none"> <li>• More effective use of ODA for climate change activities</li> <li>• Provision of incentives to increase private funds</li> </ul>
5. Capacity-building	<ul style="list-style-type: none"> <li>• Institutional capacity-building for setting up DNA</li> <li>• Practical capacity-building for CDM implementation</li> <li>• Capacity-building for negotiators</li> </ul>

### 8.5.1 Market-based mechanisms

There was a general consensus that CDM reform is one of the most important and urgent issues to be addressed in the climate regime beyond 2012. The complex and time-consuming procedural process of the CDM-EB should be simplified (by strengthening the institutional capacity of EB to hasten the approval process), so that the CDM can gain more professional support (Sugiyama et al 2005). In order to enhance sustainable development benefits of CDM projects, preferential treatment of such projects during review process was considered useful. More substantial funding sources for CDM projects need to be established, since the PCF and other current sources are not sufficient (Michaelowa 2004). In particular, there is a necessity to expand the demand for CER through establishment of a fund to remove the fear of investment risks and concern about non-existence of brokers. It is also important to ensure the continuity of the CDM beyond 2012, which may increase the current low price of CER. Additionality guidelines should be relaxed so that more countries can proactively participate in the CDM. Uneven geographical distribution in the CDM projects could be adjusted by appropriate intervention by the international organisations.

### 8.5.2 Adaptation

Participants suggested that enhancement of funding for adaptation (Murdiyarso 2004), increasing the current 2% share of CDM proceeds for an adaptation fund, mainstreaming adaptation into development plans, establishment of a global insurance mechanism, and options for technology transfer in adaptation should be considered in the future framework. Several participants felt that an adaptation protocol might not be a realistic option to meet their expectations, considering the long time taken for entry into force of the Kyoto Protocol.

### 8.5.3 Technology issues

Participants recommended that future regime discussions must focus on promoting private-private partnerships among various countries, and on designing options for more effective coordination between the public and private sectors. Some participants (e.g., Malaysia) underscored the importance of establishing a long-term structured framework for technology transfer. The future regime discussions should examine prospects for utilising market mechanisms for technology transfer (e.g., technology transfer CDM). The future framework should also focus on the utilisation of technology transfer potential among developing countries, such as through South-South technology transfer (Shukla et al 2004).

***Future regime discussions must focus on promoting public-private partnerships and on establishing a long-term structured framework for technology transfer.***

### 8.5.4 Financial assistance

Participants noted that a more effective use or reallocation of current ODA for both mitigation and adaptation would be necessary in the future to complement the slow progress in operationalisation of the SCCF and LDCF.

### 8.5.5 Capacity-building

Most of the participants argued for additional institutional and human capacity-building to tackle climate change issues in the region. They suggested that the future regime should provide opportunities for enhancing capacity of negotiators from developing countries.

## 8.6 Epilogue

Most of the participants representing ASEAN, LDCs and PIC in the region at our consultations reaffirmed that poverty alleviation and economic development are overriding priorities and that the climate change is not yet a high policy priority. Therefore, it is important to reframe the climate issue as a developmental issue. Indeed a stable climate is a vital component to achieve sustainable development, and sustainable developmental policies are in turn crucial to attain a stable climate.

Our consultations revealed a strong preference for the CDM and technology transfer in South and South-east Asian countries, and for the adaptation in LDCs and PIC. It is thus important for negotiators and policy-makers from those countries to be more proactively involved in discussions on their priority topics at international negotiations on the future climate regime and resolve their concerns in a constructive manner. In addition, all countries should devote themselves to the cause of creating a stable climate by adopting innovative mitigation and adaptation policies domestically.



## 9. REGION-WIDE ASSESSMENT

This chapter summarises the concerns and interests of the Asia-Pacific region on the climate regime beyond 2012 under six broad themes: (1) development; (2) equity; (3) market-based mechanisms; (4) technology development and transfer; (5) adaptation; and, (6) negotiation and research capacity.

### 9.1 Development

*Climate change per se is marginal and a lower national priority than economic and social development policies in much of Asia.*

The overriding priority for Asia is development. Climate change per se is marginal and a lower national priority than economic and social development policies, including energy security, food security, poverty alleviation, and rural development (see, for example, Berk, et al., 2001; Najam, et al., 2003). While many Asian countries have been experiencing rapid economic growth recently, there still remain considerable gaps in economic prosperity and social well-being between countries in the region and other developed countries. Table 9.1, for example, shows the degree to which basic economic development and infrastructure services in the region fall behind those of developed countries. Such economic disparities spur eagerness for further economic growth and improvement of the quality of life in Asia.

**Table 9.1 Economic development and infrastructure stocks in Asia**

	Gross national income per capita (PPP in US \$) 2004	Installed capacity per 1,000 persons (kW) 2001	Electricity consumption per capita (kWh) 2001	Average telephone mainlines per 1,000 persons 2001	Road density (km/sq, km of land) 2000	Access to improved water resources (% of population) 2000
Developing countries	3,575	272	1,054	95	0.15	78
East Asia	4,589	223	921	59	0.15	71
South Asia	2,397	99	426	31	0.94	76
Developed countries	24,218	2,044	8,876	501	0.58	99

Source: World Bank 2004.

**Table 9.2 Priorities in developmental issues in the Asia-Pacific region**

	Mean	Median
Energy security	2.9±1.22	3
Poverty alleviation	2.2±1.13	2
Industrialisation	1.8±1.08	1
Food security	1.7±1.09	1
International trade	1.6±0.92	1
Rural development	1.5±0.92	1
Deforestation/desertification	1.5±1.02	1
Biodiversity	1.4±0.82	1

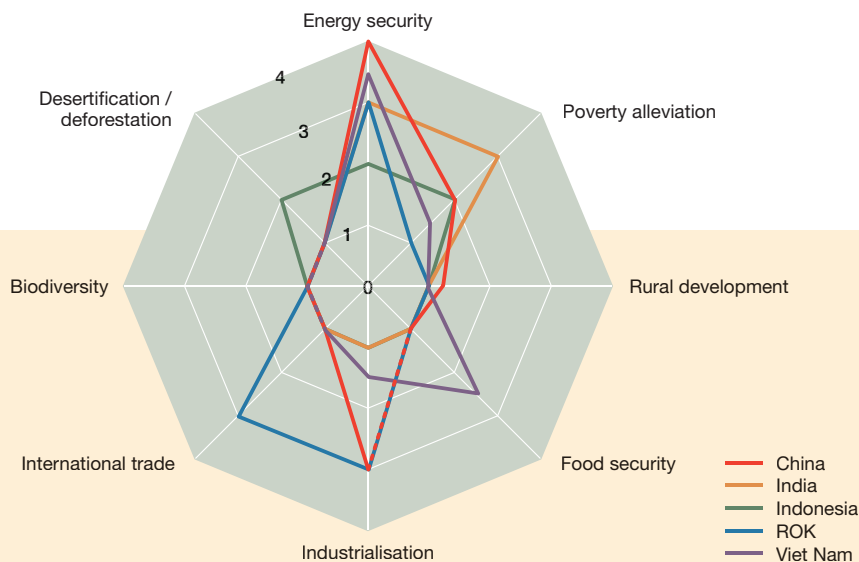
Note: Priority was rated on a scale of 1 to 4 (1: very low, and 4: very high). Number of respondents: 67 [China (15), India (15), Indonesia (15), Republic of Korea (10), and Viet Nam (12)].

The order of priority of specific developmental issues varies, however. A survey through a questionnaire on prioritisation of eight developmental issues (energy security, food security, rural development, poverty alleviation, industrialisation, international trade, biodiversity, and desertification/deforestation) on a scale of 1 to 4 (1: very low, and 4: very high) showed that energy security received more attention than others (Table 9.2).<sup>1</sup> The current hike in oil prices, among other factors, may have influenced the outcome. Furthermore, and perhaps more fundamentally,

<sup>1</sup> While looking at the above results, two caveats should be noted. First, the sample size was limited, and the survey did not follow the formal procedure of sampling. To overcome these shortcomings, we pursued a well-balanced representation of participants from not only the environment-related ministries but also the economy and development-related ministries in each country. See Annexure 1 for the list of institutional affiliations of participants. Second, we realise that participants shared a similar background in terms of their awareness on economic and environmental issues, which in turn may produce a particular bias.

burgeoning energy demand in emerging Asian markets due to rapid economic growth fuelled serious concerns on the energy shortage in the region, especially in China, India, Republic of Korea and Viet Nam (Fig. 9.1).

**Figure 9.1 Diversity of preferences for developmental issues in selected Asian countries in relation to discussions on future climate regime**



National circumstances seem to have influenced the outcome of consultations in each country considerably. Participants from the Republic of Korea, Viet Nam, Indonesia, and China placed high priority on international trade, food security, desertification and deforestation, and rural development respectively in relation to discussions on the climate regime beyond 2012. For example, Viet Nam’s interest in food security seems to be accurately reflected in the current Five-year Socio-Economic Development Plan (2001-2005). Such diversity of interests confirms the need for considering different national circumstances in designing the future climate regime.

It may be concluded that the Asia-Pacific region is still facing enormous challenges in economic development as compared with developed countries and that climate change per se is not a priority. Therefore, future climate change discussions should consider legitimate developmental concerns of the region more seriously than before.

*The wide diversity in developmental priorities of various countries shows the need for considering different national circumstances in designing the future climate regime.*

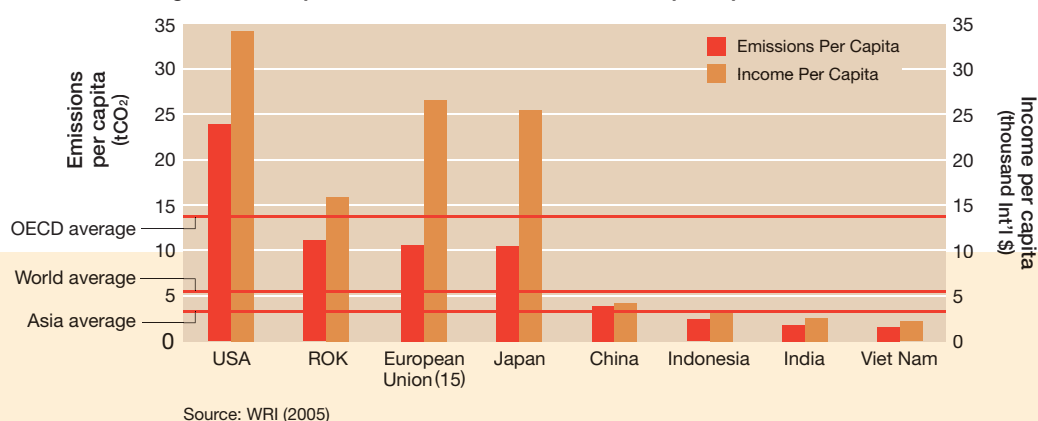
## 9.2 Equity

Several participants pointed out the importance of equity issues in designing a future climate regime, as was already pointed by several others worldwide (see also Ashton and Wang 2003; Ott et al 2004). They argued that it would be unfair that developed countries, which had considerable responsibility but failed to reduce their GHG emissions so far, would require developing countries to take on commitments to address climate change when there are huge gaps between developed and most of the Asian developing countries in GHG emissions and income per capita (GHG emissions per capita of the

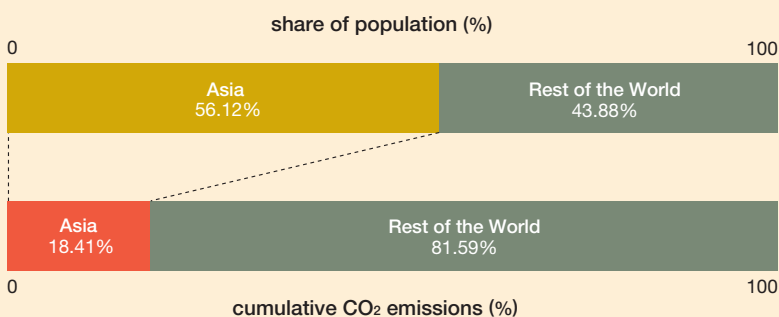
*Asia's GHG emissions are under-represented as compared with its large share of population in the world.*

Republic of Korea, however, exceed those of Japan and EU 15) (Fig. 9.2). Furthermore, compared with their large share of population, GHG emissions from Asia are under-represented (Figs. 9.3 and 9.4).

**Figure 9.2 Comparison of GHG emissions and income per capita in 2000**



**Figure 9.3 Asia's share of population (2000) and cumulative CO<sub>2</sub> emissions (1850-2000)**



*There are several dimensions in equity with regard to climate change discussions, but we examined equity based on five principles.*

While there are several dimensions in equity with regard to climate change discussions, we examined equity based on the following five principles:

- (1) Egalitarian—All human beings have equal rights to “use” the atmosphere and emit GHG;
- (2) Sovereignty—Current emissions constitute a “status quo right”.
- (3) Historical responsibility—Mitigation efforts should be allocated according to a country's share of historical responsibility for causing climate change;
- (4) Capability/capacity—Mitigation efforts should be allocated according to a country's ability to pay, as well as its mitigation opportunities; and,
- (5) Basic needs—Securing basic human rights is a minimal requirement and all individuals have equal rights for development.

A questionnaire survey on prioritisation of equity principles for future regime discussions, on a scale of 1 to 4 (1: very low, and 4: very high) showed that historical responsibility was recognised as the most important principle, followed by basic needs, capacity/capability, egalitarian, and sovereignty (Table 9.3). Such prioritisation is different, however, from the moral hierarchy of equity, where basic needs come first, and capability/capability, responsibility, and sovereignty follow (den Elzen, et al., 2003). The disparity in results may be related to deep frustration among Asian developing countries regarding the lack of progress in accounting for historical responsibility, although Brazilian proposal on the same point was discussed long ago.

*Survey on prioritisation of equity principles for future regime discussions showed that historical responsibility was recognised as the most important principle, followed by basic needs, capacity/capability, egalitarian, and sovereignty.*

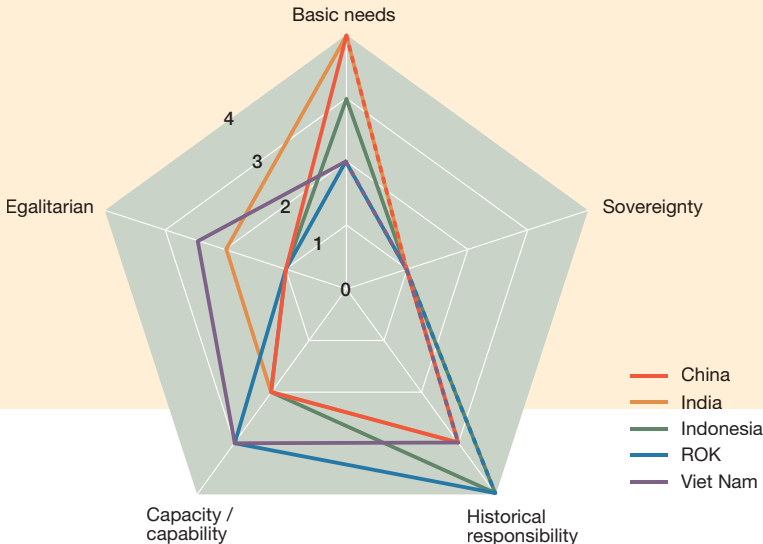
**Table 9.3 Asian priorities for equity principles in relation to discussions on future climate regime**

	Mean	Median
Historical responsibility	2.9±1.08	3
Basic needs	2.8±1.15	3
Capacity/capabilities	2.2±1.06	2
Egalitarian	1.9±1.43	1
Sovereignty	1.4±0.82	1

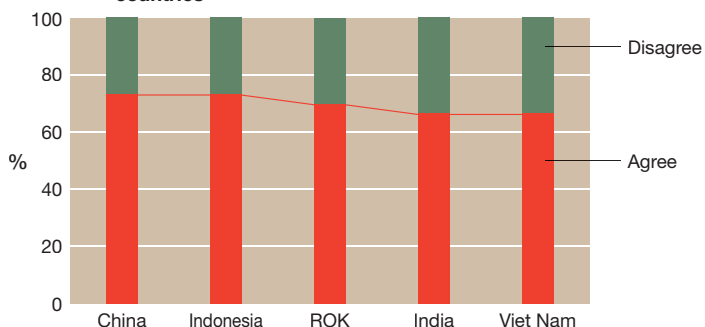
Note: Priority was rated on a scale of 1 to 4 (1: very low, and 4: very high). Number of respondents: 67 [China (15), India (15), Indonesia (15), Republic of Korea (10), and Viet Nam (12)].

Responses to equity principles were diverse among countries of the region (Fig. 9.4). Viet Nam and India, for example, placed relatively high priority on the egalitarian principle, perhaps because it is important for them to claim that as individual nations they have rights to emit GHG as much as other nations. By the same token, the general preferences to the historical responsibility principle and the capacity/capability principle must be understood.

**Figure 9.4 Diversity of preferences for equity principles in relation to discussions on future climate regime**



**Figure 9.5 Diversity of responses to the proposal of differentiation of GHG emission control commitments in selected Asian countries**



Interestingly, and contrary to our expectations, around 70% of the participants agreed to the idea that developing countries would need to accept GHG control commitments in the future with a condition that some sort of differentiation among them would be necessary (Fig. 9.5). While there was a strong argument, especially in India, that it was premature for developing countries to take on any emissions reduction or control commitments, most of the participants who responded to the questionnaire recognised the need for mitigation action by developing countries. Insofar as the differentiation of countries is concerned, the

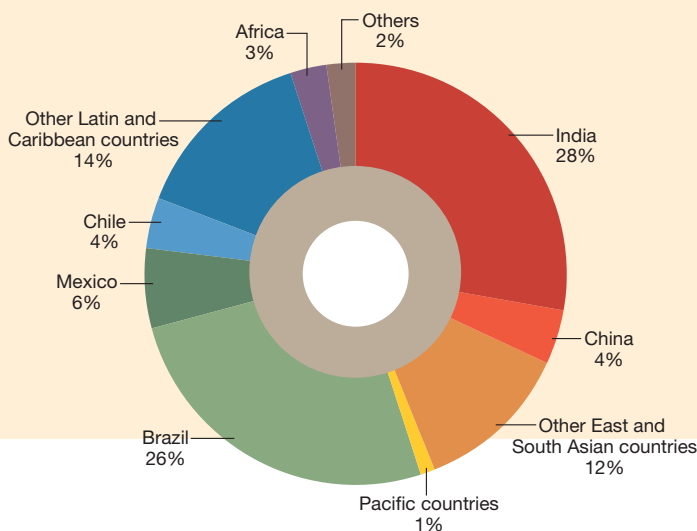
questionnaire did not prescribe criteria or specific forms of commitments; hence it is likely that participants believed that their countries would benefit from such differentiation.

From the perspective of equity, the Asia-Pacific region is under-represented in the current climate regime. On one hand, such equity concerns legitimise their rights to develop and, arguably, more rights to emit GHG. On the other hand, our consultations showed that most countries would be willing to take action under an equitable framework for the differentiation of GHG control commitments.

### 9.3 Market-based Mechanisms

Asia has been playing a leading role in the CDM as it hosts 16 out of 33 registered projects (as of 5 November 2005) and nearly 43% of 316 project activities under or after validation (Fig. 9.6). Geographical bias of CDM project activities was observed as only 3 Asian LDCs (Bangladesh, Bhutan and Cambodia) and only one Pacific island country (Fiji) have one CDM project activity each, while as many as 13 other LDCs and most small island developing states (SIDS) do not have any project to date.

**Figure 9.6 Geographical distribution of CDM projects under or after the validation process**



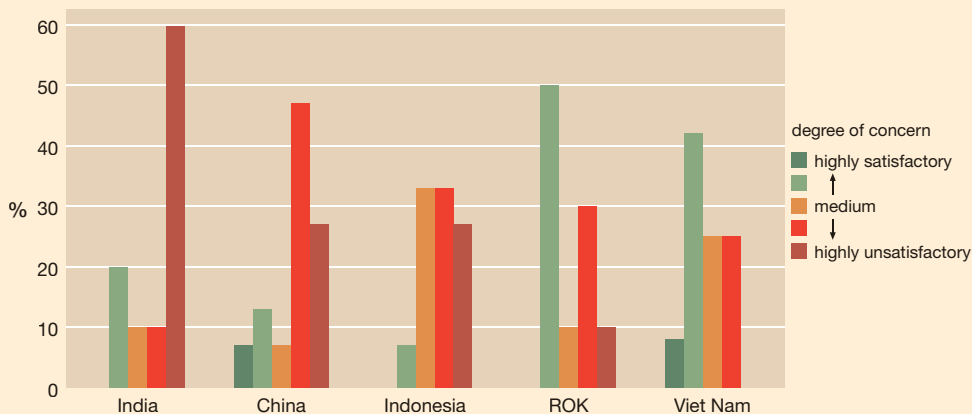
*Geographical bias of CDM project activities was observed within Asia as many projects are based in India and China. Only 3 Asian LDCs (Bangladesh, Bhutan and Cambodia) and only one Pacific island country (Fiji) have one CDM project activity each.*

Source: UNFCCC (2005b)  
Note: Total number of the projects is 316 as of 14 October 2005.

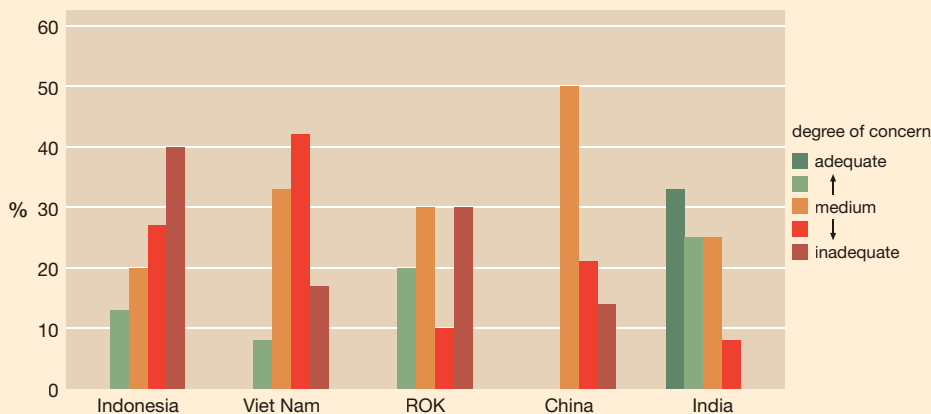
Frustration regarding slow the development of the CDM was expressed consistently in all countries (Fig. 9.7). In particular, 60% of participants from India regarded the CDM implementation at the international level highly unsatisfactory. It is perhaps related to the fact that only seven out of 107 projects approved by the Indian DNA were registered by the CDM-EB to date. Table 9.4 lists the major concerns on the current CDM and some suggestions for its restructuring, which were mentioned during our consultations. A diversity of the degree of concern on domestic institutional capacity for implementing the CDM was evident (Fig. 9.8). These results suggest that obstacles to the full-fledged implementation of the CDM do exist, not only at international level, but also at domestic level in the host countries. The need for capacity-building was recognised, especially in countries where domestic institutional capacity is inadequate.

**Obstacles to the full-fledged implementation of the CDM do exist, not only at international level but also at domestic level, in Asia.**

**Figure 9.7 Diversity of concerns on implementation of the CDM in selected Asian countries**



**Figure 9.8 Diversity of concerns on domestic institutional capacity for the CDM in selected Asian countries**



**As the CDM in its current form is not promoting sustainable development adequately in the developing countries, it is crucial to remove various barriers and strengthen the CDM in the climate regime beyond 2012.**

The questionnaire survey showed that while around 92% of the participants agreed on the continuity of the CDM beyond 2012, 94% of them saw the necessity to reform of the CDM, either within the first commitment period, or after 2012. In the light of the concern that the CDM in its current form is not promoting sustainable development adequately in the developing countries, it is crucial to remove various barriers and strengthen the CDM in the climate regime beyond 2012.

**Table 9.4 CDM-related concerns in the Asia-Pacific and some suggestions for strengthening the CDM in the future climate regime**

Category	Concerns	Ways of restructuring
Institutional concerns	<ul style="list-style-type: none"> <li>• Complexity and rigidity of project approval process.</li> <li>• Slow approval process in host countries due to weak institutional capacity.</li> <li>• Marginal contributions to sustainable development (e.g., very few energy efficiency or forestry projects).</li> <li>• Lack of contribution in technology transfer to developing countries.</li> <li>• Weak institutional capacity in host countries.</li> <li>• Geographical bias in terms of host parties.</li> <li>• Uncertainty in continuity of the CDM beyond 2012.</li> </ul>	<ul style="list-style-type: none"> <li>• Streamlining of project approval process through institutional reform of the CDM including the Executive Board.</li> <li>• Strengthening of institutional and human capacity, where it is inadequate.</li> <li>• Preferential measures to promote CDM projects with local sustainable development benefits, including energy-efficiency and forestry projects.</li> <li>• Adoption of sector-based approach to CDM and of policy-based CDM.</li> <li>• Promoting purchasing arrangements for CERs beyond 2012.</li> </ul>
Technical concerns	<ul style="list-style-type: none"> <li>• Technical difficulties in methodology development.</li> <li>• Complexity of baselines and additionality.</li> </ul>	<ul style="list-style-type: none"> <li>• Standardisation of methodology development.</li> <li>• Relaxation of conditions of baselines and additionality.</li> </ul>
Financial concerns	<ul style="list-style-type: none"> <li>• High transaction costs for project development.</li> <li>• Uncertainty in price and volume of CERs.</li> <li>• Difficulties in getting project finance, including underlying finance.</li> <li>• Difficulty in securing willingness of private sector (both in investing and host countries).</li> </ul>	<ul style="list-style-type: none"> <li>• Reduction in transaction costs.</li> <li>• Additional support to financing of CDM projects, especially during early developmental stages (e.g., the upfront payment schemes of Japan).</li> </ul>
Legal concerns	<ul style="list-style-type: none"> <li>• Complexity and lack of transparency of regulations in host countries (e.g., differential rates of taxation on CERs in China).</li> <li>• Legal status of CERs.</li> <li>• Distribution of CERs from projects using ODA for underlying finance.</li> </ul>	<ul style="list-style-type: none"> <li>• Streamlining of legal institutions.</li> </ul>

## 9.4 Technology Development and Transfer

Technology development, deployment, and dissemination were seen by most participants as a key factor in tackling climate change. However, they expressed that the current regime largely failed to promote the deployment and transfer of relevant technologies to Asian countries. While there is a wide range of GHG mitigation technologies, their relative importance varies across countries, reflecting economic size, developmental stage, and geographical location (Table 9.5).

High use of traditional fossil fuels, such as coal in Asia, has significant implications for GHG emissions. Particularly, China and India have coal-based energy structures, and will continue to rely on coal in their energy mix over the next decades. Faster commercialisation, deployment and local dissemination of technologies, including clean coal technologies, switching from coal to natural gas, and increasing the use of renewable and nuclear energy can drive down demand for coal, thereby contributing to lower CO<sub>2</sub> emissions from power generation (IEA 2004).

*Participants expressed that the current regime largely failed to promote the deployment and transfer of relevant technologies to Asian countries.*

**Table 9.5 Relative importance of technologies in relation to GHG mitigation**

	China	India	Indonesia	ROK	Viet Nam	Japan
Clean coal technologies	✓✓✓	✓✓✓	✓✓	✓✓	✓✓	✓✓
Energy efficiency improvement in supply and end-use technologies	✓✓✓	✓✓✓	✓✓	✓✓✓	✓✓	✓✓
Shift to natural gas	✓✓	✓✓	✓	✓	✓	✓✓
<b>Renewable energy</b>						
Wind	✓✓	✓✓	✓	✓✓	✓	✓✓
Solar	—	✓✓	—	✓	✓	✓✓✓
Geothermal	✓	✓	✓✓✓	—	—	✓✓
Biomass	✓✓	✓✓✓	✓	✓✓	✓	✓
Hydro	✓	✓✓	✓✓	—	✓	✓
Nuclear energy	✓✓	✓✓	—	✓✓✓	✓✓	✓✓
Advanced transportation technologies	✓	✓	—	✓✓✓	—	✓✓✓
<b>Carbon capture &amp; storage</b>						
Geological	✓✓	✓	✓	—	✓	—
Forest sinks	✓✓✓	✓✓	✓✓✓	✓	✓✓✓	✓

Note: Key for rating: ✓✓✓ (extremely important), ✓✓ (very important), ✓ (important), and — (not important or not relevant).

Participants noted that many technologies, especially renewable energy technologies, were not yet commercially competitive and that the transfer of climate-friendly technologies was very limited (ICCEPT, 2002). The need for accelerating the pace of technology transfer was repeatedly emphasised here and elsewhere (for example, Murphy et al., 2005). Table 9.6 lists various technology-related concerns and some ways to resolve them in future regime discussions.

*The need for accelerating the pace of technology transfer to Asian countries was repeatedly emphasised in our consultations.*

**Table 9.6 Technology-related concerns and suggested ways of improvement**

Concerns	Ways of improvement
<ul style="list-style-type: none"> <li>• High cost/high capital intensity.</li> <li>• Lack of financing and investment.</li> </ul>	<ul style="list-style-type: none"> <li>• Creation of a new financial scheme focussing on technology transfer and dissemination.</li> <li>• Promotion of awareness and confidence among financial institutions of long-term benefits of investment for energy-efficiency improvement.</li> </ul>
<ul style="list-style-type: none"> <li>• Rigidity of intellectual property regime.</li> </ul>	<ul style="list-style-type: none"> <li>• Shorten the duration of IPR protection from current 20 years.</li> <li>• Streamline the current IPR regime by considering global public goods nature of climate-friendly technologies while simultaneously protecting the interests of the patent holders of such technologies along the lines of approaches adopted for HIV/AIDS drugs.</li> </ul>
<ul style="list-style-type: none"> <li>• Mismatch between needs and supply.</li> <li>• Limited domestic capacity.</li> <li>• Difficulty in local dissemination.</li> </ul>	<ul style="list-style-type: none"> <li>• Promote technology needs assessment.</li> <li>• Facilitate international programmes for capacity-building, including information sharing.</li> <li>• Institutionalise a domestic market in a way that adopting clean technologies is rewarded.</li> </ul>



*The lack of policy-relevant scientific information and shortage of funding are seen as major bottlenecks to facilitate adaptation to climate change in Asian countries.*

## 9.5 Adaptation

The high degree of vulnerability to impacts of climate change in Asia is well-known (Table 9.7). In reality, however, such concerns have not been effectively taken into account in the policy-making process. In India, for example, it was pointed out that none of ongoing water resources planning for the next fifty years has seriously considered the impacts of climate change. The Chinese government, too, has not paid full attention to the impacts of climate change when designing its national development plans, including reservoir construction plans.

**Table 9.7 Vulnerability of key sectors to impacts of climate change in Asia**

Regions	Food and fiber	Biodiversity	Water resources	Coastal ecosystems	Human health	Settlements
Temperate Asia	-2 / H	-1 / M	-2 / H	-2 / H	-2 / M	-2 / H
Tropical Asia						
South Asia	-2 / H	-2 / M	-2 / H	-2 / H	-1 / M	-2 / H
Southeast Asia	-2 / H	-2 / M	-2 / H	-2 / H	-1 / M	-2 / H

Scale for rating of vulnerability: highly vulnerable (-2), moderately vulnerable (-1), slightly or not vulnerable (0), slightly resilient (+1), and most resilient (+2). Confidence levels abbreviated to VH (very high), H (high), M (medium), L (low), and VL (very low). Source: IPCC 2001b.

Table 9.8 summarises the major challenges noted by participants with regard to the formulation and implementation of adaptation measures in Asia. The lack of policy-relevant scientific information at the domestic level and shortage of funding at the international level were seen as major bottlenecks. Since adaptation actions would have to be conceived and implemented within the context of national planning (the so-called

**Table 9.8 Challenges to adaptation in the Asia-Pacific region and suggested ways of improvement**

	Challenges	Ways of Improvement
<b>Domestic challenges</b>	<p><b>Science-related challenges</b></p> <ul style="list-style-type: none"> <li>Scientific uncertainty on the impacts of climate change.</li> <li>Limited research on local vulnerability and assessments.</li> </ul> <p><b>Policy-related challenges</b></p> <ul style="list-style-type: none"> <li>Limited awareness among key political actors.</li> </ul> <p><b>Resource-related challenges</b></p> <ul style="list-style-type: none"> <li>Shortage of relevant technologies.</li> <li>Shortage of finance.</li> </ul>	<ul style="list-style-type: none"> <li>Capacity development of scientists and experts in vulnerability assessment and adaptation planning.</li> <li>Provision of information and data, with international assistance, relevant to the above.</li> <li>Information dissemination and public awareness promotion on needs of long-term planning and investment.</li> <li>Strengthening of international funding mechanisms for adaptation, and enhancing their flexibility.</li> <li>Provision of additional "adaptation-focused" ODA.</li> </ul>
<b>International challenges</b>	<p><b>Shortage of funds for adaptation</b></p> <ul style="list-style-type: none"> <li>Contributions to the Special Climate Change Fund (SCCF) and the Least-Developed Countries Fund (LDC Fund) are far from adequate and below their commitments.</li> <li>Two percent of the CDM proceeds for the Adaptation Fund are seen as inadequate.</li> <li>Immaturity of the CDM market made the Adaptation Fund meaningless so far.</li> </ul> <p><b>Poor operation of international mechanisms</b></p> <ul style="list-style-type: none"> <li>Complexity and rigidity of conditions for GEF funding especially with regard to "incremental costs" and "global benefits".</li> </ul>	<ul style="list-style-type: none"> <li>Promotion of understanding and agreements on prioritisation in international financing.</li> <li>Integration of available "adaptation" funds into conventional "development" funds.</li> <li>Further focus on development and transfer of adaptation technologies.</li> <li>Elaboration of CDM projects which might contribute to adaptation, and new CDM scheme that can incorporate combination of various funds, such as private investment, ODA, and other benevolent funds.</li> <li>Enhancing the flexibility for accessing GEF funds allocated for adaptation.</li> </ul>

adaptation-development continuum), and ODA often covered adaptation-relevant areas, such as coastal defence, water resources, and health care, “additional” ODA was seen by many participants as a good starting point for addressing adaptation in the region.

## 9.6 Negotiation and Research Capacity

For Asian countries to engage confidently in international climate negotiations, the capability of negotiators to influence decisions by emphasising their country’s interests is crucial. However, there are many significant concerns on the negotiation capability of countries in the Asia-Pacific region.

First, the number of delegates from most Asian countries to the UNFCCC process is small. Unlike developed countries, most countries cannot afford to send a large number of delegates. Although participation to the UNFCCC process was financially supported to some extent, it was considered inadequate. For example, the number of supported delegates from Pacific island countries was recently reduced from two to one due to financial constraints at the UNFCCC.

Second, policy-relevant research on climate change is limited in most countries. For example, an analysis of authorship of nearly 130 publications in English on the future climate regime showed that 80% of them were from the USA and Europe, and very few were from Asia (Kameyama, 2004b). Another example is the limited participation of Asia-Pacific experts in the IPCC process (Table 9.9). While there were as many as 1760 contributors from the USA and Europe, only 238 were from Asia. Furthermore, in all IPCC reports, very few examples and case studies were reported from Asia.

*There were only 238 contributors from the entire Asia-Pacific region to the IPCC Third Assessment Report against 1760 contributors from the USA and Europe.*

**Table 9.9 Contributors\* to the IPCC Third Assessment Report**

	Scientific Basis	Mitigation	Impacts, Adaptation, & Vulnerability	Total
China	22	13	25	60
India	7	20	9	36
Indonesia	0	1	2	3
Japan	38	48	22	108
Republic of Korea	1	2	0	3
Viet Nam	1	1	0	2
Other Asian countries	4	6	16	26
<b>Total of Asia</b>	<b>73</b>	<b>91</b>	<b>74</b>	<b>238</b>
EU	543	196	166	905
USA	558	177	120	855
<b>Total of USA &amp; EU</b>	<b>1,101</b>	<b>373</b>	<b>286</b>	<b>1,760</b>

\*Contributors include authors and reviewers.

***The involvement of Asian NGOs in international climate negotiations is very limited. Only 61 out of 514 NGOs with observer status at the Conference of the Parties were from Asia.***

Third, the involvement of Asian NGOs in international climate negotiations is very limited. Among the 514 NGOs having observer status at the Conference of the Parties (as of August 2005), there were only 61 Asian NGOs (11.8%). Among those, 32 represented one country, Japan (52%), with 13 from India (21%), 6 from China (9.8%), 3 each from the Republic of Korea, the Philippines and Malaysia, and only one from Pakistan, Thailand, Bangladesh and Indonesia.<sup>2</sup> This shows that most Asian countries do not have the adequate capacity to effectively represent their views in international climate negotiations.

The questionnaire survey confirmed that even large countries, such as China and India, were highly concerned on the capability of their negotiators to influence decisions on the future climate regime through emphasising national interests (Table 9.10).

**Table 9.10 Degree of concern on the capability of national negotiators**

	Mean	Median
India	3.6±1.36	4
China	3.5±1.13	4
Viet Nam	3.5±1.09	4
Republic of Korea	3.3±1.16	3
Indonesia	3.2±1.34	3

Note: Concern was rated on a scale of 1 to 5 (1: least concerned, and 5: extremely concerned). Number of respondents: 67 [China (15), India (11), Indonesia (16), Republic of Korea (10), Viet Nam (12)].

Such negotiation and research capacity-related concerns are likely to result in feelings of uncertainty about national interests and a general scepticism about new policy initiatives at the international level (Gupta 1998). The strengthening of capacity in terms of negotiation personnel, policy-relevant research, and funding is crucial, therefore, to reflect the concerns and real interests of the Asia-Pacific region in the design of the future climate regime.

***It may be concluded that the current regime largely failed to effectively address concerns of Asia so far. On the other hand, most countries in the region have not established the political foundations to tackle climate change nationally, regionally and globally.***

## **9.7 Epilogue**

Our first round of consultations with diverse stakeholders across the region revealed specific concerns and interests of the Asian countries. On one hand, it may be concluded that the current regime largely failed to effectively address their concerns so far. On the other hand, most countries seem to have not established the political foundations to tackle climate change nationally, regionally and globally. Participants proposed the following ideas, inter alia, for strengthening the future climate regime from an Asian perspective:

<sup>2</sup> UNFCCC (2005a)

- Developmental concerns, energy security in particular, should be addressed as a priority issue in designing the future regime. Due consideration of equity issues would be crucial to engage Asian countries in the future regime.
- The future climate regime should be flexible enough to accommodate diverse national circumstances. One suggested approach to ensure such flexibility is the differentiation of developing countries in GHG mitigation and adaptation.
- Priority should be given to CDM projects with local sustainable development benefits.
- As technology plays a critical role, future regime discussions must focus on removing current barriers to technology transfer at both the international and the host-country levels in Asia.
- The future climate regime should focus on various options for mainstreaming adaptation in Asian development.
- As the issue of financing is one of the biggest barriers to address climate change in most Asian countries, future climate regime discussions should identify ways to devise more flexible inter-governmental financing mechanisms (especially for adaptation activities), and to direct more private financial flows towards climate-friendly development.
- Options for strengthening capacity of Asian negotiators and NGOs to contribute to the design of future climate regime must be pursued more consistently than before.

We are confident that building the future climate regime based on the above ideas could lead to the development of a more sustainable Asia without undue environmental burden.

## 10. CONCLUSIONS AND SUGGESTIONS

IGES conducted a series of consultations in several countries of the Asia-Pacific region to ascertain their concerns, interests and priorities for the future climate regime beyond 2012. It is important to bear in mind that no country has yet stated its official position on the climate regime beyond 2012, and the outcomes of our consultations are at best only indicative of such positions in the future. Further, participants were relatively more certain in identifying national concerns and interests than on their priorities for restructuring or strengthening the future regime. While recognising that countries are highly diverse in their interests and circumstances, we believe that future regime discussions should focus on the following issues in order to address Asian concerns and interests more effectively and adequately.

*Future discussions should focus on incentives for climate-friendly policies and measures to meet energy security needs of Asian countries.*

*Several developing countries in Asia have traditionally adopted climate-friendly lifestyles; adequate recognition and promotion of such lifestyles may be crucial in future.*

**1. Developmental priorities:** The Asia-Pacific region, despite recent rapid economic growth rates, faces significant developmental challenges, such as poverty alleviation, food security, energy security and local environmental protection. Although climate change can exacerbate such challenges, it is not yet a high priority in the developmental planning in most countries. Progress in GHG mitigation and adaptation in the Asian context can only occur if such initiatives are pursued from the perspective of development goals rather than pure environmental concerns.

It is thus important to identify various options for mainstreaming climate concerns in development policies and strategies, especially in sectors, such as agricultural and industrial development, water resources development, public investment in infrastructure and promotion of tourism. Grappling with the long-term impacts of climate change on the development framework is also the key in the adaptation context. Future discussions should focus on incentives for climate-friendly policies and measures to meet energy security needs which do not necessarily increase GHG emissions (e.g., those for expanding the use of natural gas use which may reduce dependency on imported oil, or may improve long-term energy or resource efficiency).

**2. Leadership by developed countries:** Several policy-makers across the region argued that lack of demonstrable progress by Annex I countries in terms of their commitments to GHG emissions reductions, finance, technology transfer and capacity building, and unsustainable lifestyles of developed countries remains a major barrier for stabilisation of global climate, and that developed countries must take leadership in demonstrating that economic and social development can indeed be climate-friendly.

Research into ways to transform social and behavioural preferences for existing technologies and lifestyles and policies and measures promoting such transformation may be a prerequisite to make further progress. Future regime discussions must focus on designing incentives for climate-friendly initiatives and lifestyles in both developed and developing countries. Many policy-makers believe that several developing countries in Asia have traditionally adopted climate-friendly lifestyles and adequate recognition and promotion of such lifestyles may be necessary in future.

**3. Developing country participation:** Policy-makers across the region recognised that GHG emissions from the region would continue to grow in order to accommodate the basic human needs of Asian societies, and some mentioned that it is premature to talk about emission reduction targets for developing countries. They reaffirmed their readiness to reduce the growth in GHG emissions but insisted that the “common but differentiated responsibility principle” must continue to be the basis of the future regime.

Future discussions must, therefore, explore ways to involve various countries in a staged manner perhaps based on a set of criteria such as historical responsibility, per capita emission rights, development needs, etc., while building on agreed principles and improving existing instruments. Indeed involvement of developing countries could be very different from that for Annex I countries and it could be progressive and staged in an eight-step process as follows:

- Comprehensive reporting of country needs and domestic policies and measures through National Communications and other means
- Active participation in a more flexible CDM, with a clear link with national development
- Voluntary initiatives aimed at controlling emissions growth
- Pledge and review of voluntary initiatives with assistance
- Contractual commitments to modify BAU emissions growth scenarios
- Mandatory reporting of GHG emissions of all major installations
- Voluntary reduction targets
- Legally binding reduction targets

Further research on equitable and practical methods to differentiate the developing countries while considering the evolving economic and geopolitical realities is urgently warranted. Such dynamic categorisation would obviously add flexibility to the regime architecture.

**4. Market mechanisms:** Despite many market imperfections and the recognition that market mechanisms alone can by no means solve all development problems in Asia, several policy-makers agreed that market mechanisms could become a powerful force in bringing down the growth of GHG emissions. They underscored the need for building on the Kyoto mechanisms such as the CDM, and continuing and/or creating similar such mechanisms in the future regime beyond 2012. Besides noting the need for removing uncertainties on continuity of the CDM beyond 2012, nearly all countries expressed concerns for efficiency and cost of the CDM approval process and noted the need for its restructuring in the future regime without sacrificing environmental integrity in the process.

A few ideas have come up in our consultations on ways to strengthen the CDM beyond 2012 so that it could become a primary driver in the international carbon market while meeting the developmental aspirations of various countries.

- Institutional reform of the CDM including the CDM Executive Board, standardisation of methodologies, simplification of the approval process, etc.
- Reduction in transaction costs for project development and implementation
- Widening the scope of the CDM through (a) inclusion of sectoral or policy-based or technology transfer-CDM, and (b) making deforestation avoidance eligible for the CDM (as many countries in the region have significant areas under forests and deforestation has been a major source of emissions).
- Special preferences for projects with large sustainable development benefits or contribution to adaptation capability, and projects based in LDC and small island nations which are especially vulnerable to climate change impacts.
- Preference to the carbon emission reduction projects should be elaborated, because while those projects that tackle CH<sub>4</sub>, N<sub>2</sub>O and HFCs may prove cost-effective and acceptable in certain countries, the local sustainable development benefits from such projects are quite limited.

*The common but differentiated responsibility principle must continue to be the basis of the future regime discussions.*

*Market-based mechanisms can be a powerful force in bringing down the growth of GHG emissions.*

*Research on whether and how restructuring of CDM would benefit each Asian country is crucial.*

*Future regime discussions must facilitate identification of “tipping points” where small interventions or infusion of resources into technology intervention can reap large gains.*

Further research on whether and how such restructuring would benefit each Asian country is crucial. Future regime discussions may focus on ways to balance the CDM project portfolio in a given country/region.

**5. Technology development and diffusion:** Policy-makers in the Asia-Pacific fully recognise that technologies play a critical role in the mitigation of, and adaptation to climate change, but emphasise that the global progress to date in development, transfer and dissemination of climate-friendly technologies is far from satisfactory due to the existence of several barriers at every state of the technology process – technical, political, economic, cultural, social, behavioural and institutional. Insufficient enabling environment in host countries also appears to be hindering technology transfer. As the two large Asian countries – China and India – have large coal reserves and are likely to depend on them for meeting their energy needs in the foreseeable future, clean coal technologies, improvement in energy efficiency, and carbon capture and storage technologies will be critical. Likewise, the potential for exploitation of renewable energy sources in the region is enormous. Future regime discussions should, therefore, give more focus on incentives for both development and transfer of such technologies, which are likely to have significant and immediate benefits in reducing the growth of GHG emissions in the region.

Innovative approaches for technology transfer (e.g., shared international IPR along the lines of agricultural technologies by the Consultative Group on International Agricultural Research), reducing the duration of IPR protection, compulsory licensing which enables the government to grant a license to a domestic manufacturer of a technology who in turn agrees to pay royalties to the patent holder, and bilateral negotiation along the lines of Costa Rica and Merck agreement on biodiversity may suggest a step forward (Ogonowski et al 2004). The need for designing ways to facilitate the North-South and South-South technology cooperation, financing for technology transfer, and localising technologies through right mix of “technology push” (through public R&D investments) and “market pull” (through provision of incentives for private sector innovation and technology deployment) was repeatedly mentioned in several countries. The recently announced Asia-Pacific Partnership for Clean Development and Climate and other initiatives for technology cooperation should be strengthened while building on the current technology initiatives of the UNFCCC. In addition, future regime discussions must facilitate identification of “tipping points” where small interventions or infusion of resources into technology intervention can reap large gains in technology transfer. Proactive involvement of the private sector in technology transfer and dissemination should be facilitated.

**6. Financing:** Asian policy-makers acknowledge that several barriers exist in the financing of clean development both within national and regional contexts, and that the current regime, despite the establishment of Marrakech funds and other initiatives, is unable to make a significant difference in limiting GHG emissions growth in developing countries. Future regime discussions should, therefore, consider innovative financing options such as the establishment of regional funding initiatives to support climate mitigation, adaptation and South-South technology transfer, and capacity building of negotiators. On the research level, options for “climate-greening” the FDI and ODA must be further pursued, since the volume of climate-related funding in Asia is very small compared to the FDI and ODA. Integration of climate-related financing for both mitigation and adaptation into conventional development funding should be pursued.

**7. Adaptation:** There is growing recognition in Asia that climate change may undermine the ability to meet the targets set in the MDGs. Reflecting the growing urgency and increased frequency and intensity of extreme climate events in the Asia-Pacific region, policy-makers argued for an increased focus on adaptation similar to the mitigation issues at international discussions on the climate regime beyond 2012. Policy-makers across the region insisted for continued support of adaptation efforts in developing countries through long-term, firm and regular financial commitments. The views on developing an adaptation protocol were mixed with some participants highlighting the complexities in developing such a protocol, especially by considering the long duration taken for the Kyoto Protocol to enter into force. Some people opined that instead it is better to give more focus through enhancing the flexibility in guidelines for the utilisation of adaptation funds of the GEF and UNFCCC, especially for projects linking adaptation and poverty alleviation in LDCs and SIDS. The need for increasing adaptation-focussed ODA activities, such as micro-finance, micro-insurance and income diversification was emphasised in several dialogues. However, some expressed reservations that using existing ODA funds for adaptation could also reduce the pressure on donor agencies to provide additional resources.

The need for leveraging funds to support adaptation both in and outside UNFCCC process is therefore urgent. In this context, the establishment of global insurance fund or other such funds may be valid. Future regime discussions should focus on mechanisms, incentives and policies that might be used to encourage private sector investment in adaptation. Discussions must also look into how climate and disaster management communities can more proactively collaborate at various levels (in terms of synergies among conventions, on-ground operations) to improve the adaptive capacity of vulnerable regions and communities.

**8. Capacity building:** Policy-makers across the region recognised significant shortfalls in institutional and human capacities to address climate change issue at various levels. Future regime discussions must continue to deliberate on creating innovative mechanisms for strengthening capacities through building on current initiatives of the convention and the Protocol. Policies and measures to enhance the capacity of financial and legal institutions as well as policy-makers at various levels, options such as the means to support participation of more representatives from developing countries at international negotiations and strengthening the capacity of negotiators are important to make progress in developing a cooperative, inclusive and effective strategy to address climate change at the global level. Long-term human development, including that for research and development, is urgently warranted.

The first round of dialogues clearly demonstrated that the Asia-Pacific region has several genuine concerns and interests in relation to the future climate regime, and that they need be addressed thoroughly and adequately through effective strengthening and reforming of the current regime, if we are to realize the ultimate goal of stabilizing global climate.

*The need for leveraging funds for adaptation both within and outside the UNFCCC process is urgent.*

*Future regime discussions must deliberate on innovative means for strengthening institutional and human capacities in the Asia-Pacific.*



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# General Format of the Agenda at Each Meeting of the Asia-Pacific Consultations on Climate Regime Beyond 2012

## ■ Opening Remarks and Introductions of Participants

## ■ Session 1: Climate Regime from a Global Perspective

Part 1: Objectives and scope of the consultations

Part 2: A preliminary assessment of the current climate regime

Part 3: Lessons learned from previous consultations

General discussion on global and regional issues focusing on progress achieved so far and challenges ahead

## ■ Session 2: Concerns on Climate Regime from a National Perspective

- Major concerns and aspirations on the post-2012 climate regime  
(Invited presentations from national representatives)

General discussion on major concerns and interests from a national perspective

## ■ Session 3: Priorities for Restructuring Climate Regime and How Each Country Could Benefit from Such Restructuring

Moderated discussion

- Reform of market-based mechanisms (CDM, regional emissions trading, etc.)
- Technology innovation, development and transfer
- Measures to support adaptation (adaptation funds, vouchers, credits, protocol, insurance fund approach, etc.)
- Equity, financing, capacity-building and other country-specific issues (e.g., ODA for CDM and adaptation)

## ■ Session 4: Panel Discussion – Preparation for the climate regime beyond 2012: National perspectives

## ■ Wrap-up and plans for the future

# List of participating organisations

## China 30 August 2005 (Xindadu Hotel, Beijing)



Energy Research Institute (ERI)  
 National Development and Reform Commission (NDRC)  
 Centre for Energy, Environment and Climate Change Research (CEEC)  
 China GEF Office  
 China Meteorological Administration  
 Chinese Academy of Social Sciences (CASS)  
 Environmental Defense  
 Japan KOE Environmental Protection Business Consulting for China Ltd.  
 Ministry of Foreign Affairs  
 Ministry of Science and Technology of China (MOST)  
 National Weather Bureau  
 Policy Research Center for Environment and Economy (PRCEE) of State  
 Environmental Protection Administration (SEPA)  
 Renmin University of China  
 Tsinghua University

## India 29 July 2005 (Hotel Ashok, New Delhi)



The Energy and Resources Institute (TERI)  
 British High Commission  
 Department of Science & Technology  
 Development Alternatives  
 Embassy of the Republic of Bulgaria  
 Government of Kerala  
 Indian Council of Forestry Research & Education  
 Jadavpur University  
 Jawaharal Nehru University  
 Ministry of Environment & Forests  
 Ministry of Non-Conventional Energy Sources Government of India  
 Ministry of Power  
 Planning Commission  
 President's Secretariat  
 Royal Netherlands Embassy  
 Steel Authority of India Limited  
 Steel Authority of India Limited  
 Technology Information, Forecasting and Assessment Council  
 Winrock International India  
 WWF India

## Indonesia 29 June 2005 (Crowne Plaza Hotel, Jakarta)



Ministry of the Environment  
 Agency for Forestry Research and Development  
 Centre for Plantation Forest Research and Development (CPF)  
 BINA USAHA LINGKUNGAN  
 Carbon and Environmental Research  
 Centre for International Forestry Research (CIFOR)  
 Committee on Environmental Conservation, KADIN  
 Department of Foreign Affairs  
 Indonesian Renewable Energy Society (IRES)  
 Ministry of Energy and Mineral Resource  
 Rambe & Partner's (Legal Office)  
 Republic of Indonesia National Development Planning Agency (BAPPENAS)  
 WWF-Indonesia



## Japan

Electronic Industries Association of Japan

IPCC/TSU

Keio University

Ministry of Economy, Trade and Industry (METI)

Ministry of Foreign Affairs (MOFA)

Ministry of the Environment

Mizuho-DL Financial Technology

National Institute for Environmental Studies (NIES)

Ritsumeikan University

Shinnippon Steel

Tohoku University

Toyota Corporation

The Institute of Energy Economics, Japan (IEEJ)

## Republic of Korea 16 June 2005 (JW Marriott Hotel, Seoul)

Korea Environment Institute (KEI)

Korea Energy Economics Institute (KEEI)

Korea Energy Management Corporation

Ministry of Commerce, Industry & Energy

Ministry of Environment

Ministry of Foreign Affairs and Trade

## Viet Nam 28 September 2005 (Horizon Hotel, Hanoi)



Ministry of Natural Resources and Environment (MONRE)

Center for Ecology and Environment Research

Centre for Environment Research, Education and Development

Institute for Environmental Science and Technology

Hanoi University of Technology

Institute of Meteorology and Hydrology

Ministry of Agriculture and Rural Development

Ministry of Commerce

Ministry of Education and Training

Ministry of Industry

Ministry of Interior

Research Center for Climate Change and Sustainable Development

Research Center for Energy and Environment

Viet Nam Academy of Science and Technology

Viet Nam Forestry Science and Technology Association

Viet Nam National University

## Regional Dialogue 15 September 2005 (Pacifco Yokohama, Japan)



Ministry of Environment, Cambodia

Climate Change Coordinating Unit, ONEP, Thailand

Cook Islands National Environment Service

Environmental Management Bureau, The Philippines

Malaysian Meteorological Services Department

Ministry of Education and Training, Viet Nam

Ministry of Environment and Forests, India

Ministry of Environment, CDA, Pakistan

Ministry of Foreign Affairs, China

Ministry of Natural Resources and Environment, Malaysia

# About IGES

The Institute for Global Environmental Strategies (IGES), established by an initiative of the Japanese Government in 1998, is a research institute that conducts pragmatic and innovative strategic policy research to support sustainable development in the Asia-Pacific region. The mission of IGES is to promote the transformation of 20th Century society, characterised by mass production and mass consumption, to a new societal framework founded on sustainability.

Currently IGES carries out research on themes such as climate policy, urban environmental management, forest conservation, business for sustainable society, freshwater resources management, and long-term perspective and policy integration. IGES also hosts the Technical Support Unit of the IPCC National Greenhouse Gas Inventories Programme (IPCC-NGGIP) and the Asia-Pacific Network for Global Change Research (APN).

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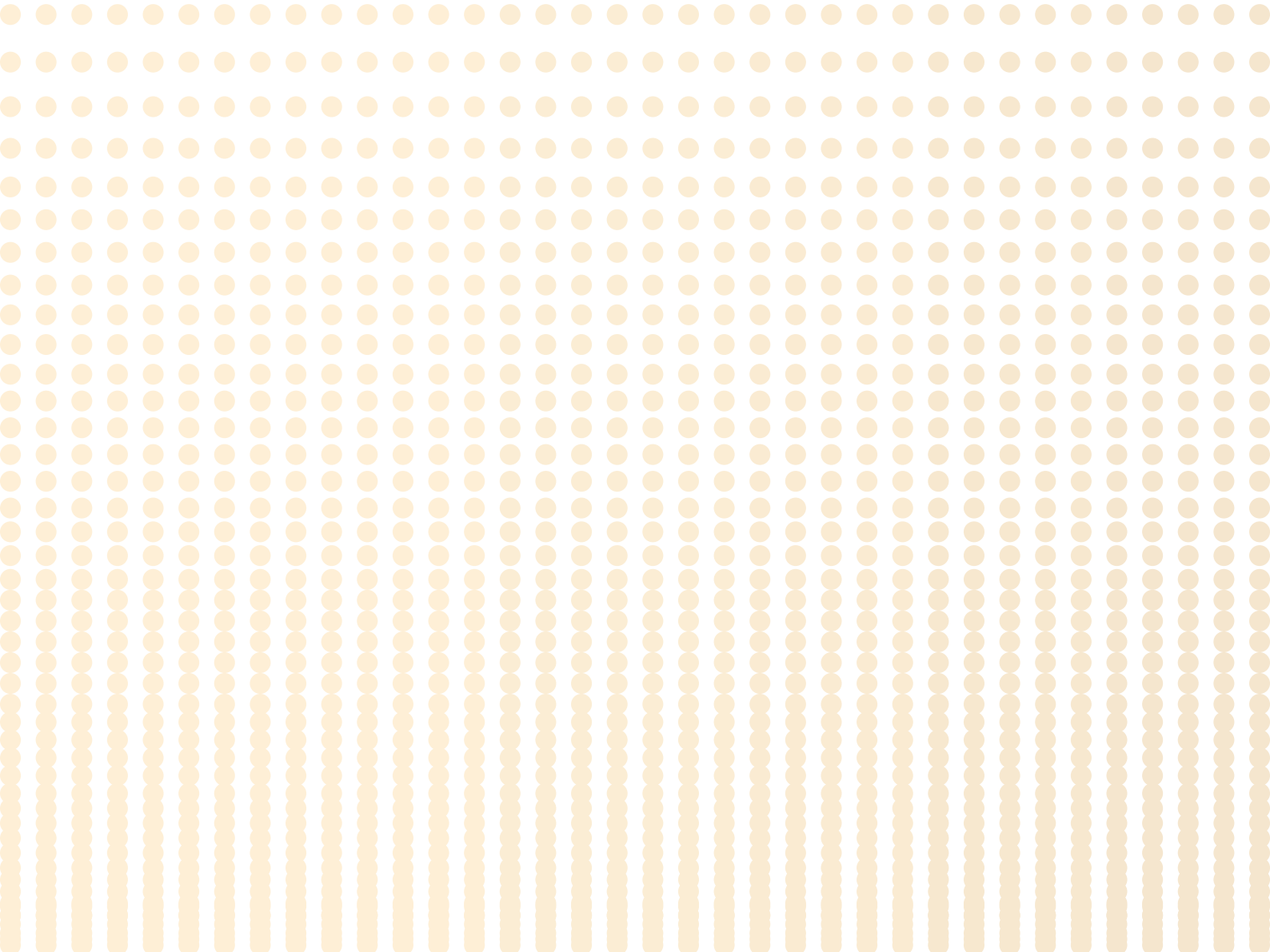
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