**SUMMARY OF KEY ELEMENTS DISCUSSED AT THE WORKSHOP ON INVESTMENT AND FINANCIAL FLOWS TO ADDRESS CLIMATE CHANGE: THE WAY FORWARD**

**31 OCTOBER 2007**
**BONN, Germany**

*The objective of the workshop was to identify gaps and prioritize needs for further work on investment and financial flows to address climate change that can be undertaken by interested organizations.*

*The workshop was attended by 107 participants among which were 42 representatives of Parties, 25 technical experts, 17 representatives from the private sector and 23 representatives from international organizations such as IFIs, UN agencies, NGOs and others.*

*This summary is not meant to present or represent the views of all the participants or of the UNFCCC. The intent is rather to provide a brief overview of the discussions that took place during the workshop.*

**Table of Contents**

## Session 1: Collection and dissemination of data on investment and financial flows to address climate change

This session focused on the identification of further needs for data collection and dissemination, their potential applications, and on the identification of institutions willing and capable of pursuing this work.

### 1. How to improve collection and analysis of data on current investment and financial flows?

Based on the work and interest of the participants in the workshop, it was clear that the data collection on investment and financial flows can serve several purposes and that collaboration among institutions could be warranted. In addition, definition of data and scope were identified as key to collect the appropriate data and to be able to explain to potential users how to interpret the data.

Important initiatives/sources of data:

- **UNEP Sustainable Energy Finance Initiative (SEFI)** released the *Global Trends in Sustainable Energy Investment 2007*. This study provides an updated accounting of the state of sustainable energy investment in OECD and developing countries.
- **Renewable Energy Policy Network for the 21st Century (REN 21)** published the *Renewables 2006 Global Status Report, which* provides information about the current status of renewable energy in the world.
- **New Energy Finance (NEF)** is tracking investments in clean energy with a database of 17,000 organizations (5,000 transactions in clean energies). NEF is also tracking transaction in carbon markets and carbon funds (USD 12 billion under management).
- **UNCTAD** publishes the *World Investment Report* yearly, which analyses trends regarding foreign direct investment (FDI). In 2008 the report will focus on FDI in infrastructure.
- The **World Bank** has started a significant research program on integrated modeling of climate change that is expected to produce useful data on investment and financial flows related to climate change. The World Bank will also be collecting data for its World Development report 2009 that will focus on climate change. The Bank is also carrying out some studies on energy subsidies (biofuels and renewable) and has started looking into adaptation and damage from climate change at a regional and national level.
- **OECD** has been applying the Rio-markers on official development assistance data.

Lessons and challenges:

- Collection of data on a quarterly basis is relevant as a lot of corporations report on that basis, but more important trends are on an annual basis.
- Triangulation between various sources is key.
- Bottom up data collection overseas is very difficult. It is impossible to collect everything. In the cases where the data is not easy to access, in particular in developing countries, aggregation is needed to derive a global total. Local sources for collecting data in particular in developing countries are crucial.
- Some data are considered sensitive and are not easily disclosed. A lot of data are collected by private specialized analysts and most of them are only available by purchase. However, at present, an increasing number of corporates and investors are becoming more open to disclose data on their activities.

- Evolution in price (due to change in supply and demand and other factors) makes it hard to translate what a dollar of investment means in concrete terms (installed facilities).
- It remains difficult to collect data on climate relevant sectors other than the energy sector like industry, transport, agriculture and forestry as the level of investments in these sectors is smaller and more dispersed.
- There are no minimum criteria to make data collected by different agents comparable.

Recommendations for next steps:

- Overall, much improvement is required with regards to systematic collection of current data, to make it useful to report or compile data on investment and financial flows relating to climate change.
- It could be useful to make the FDI data related to climate change separately available from the global FDI data. UNCTAD has shown interest in following up on this recommendation.

## 2. How to improve projection of future investment and financial flows?

Current models cover at different level of detail GHG in different sectors and regions. In addition, in most cases, the geographical disaggregation of global scenarios is limited to a few large regions. Some participants proposed that for specific studies, a higher level of disaggregation would be desirable, in particular, in the context of analyzing adaptation. In general, the models can be adapted to generate the level of detail desired provided that time and resources are allocated.

Important initiatives/sources of data:

- **Mckinsey & Co.** developed a global abatement model which is a cost curve model based on measures available to reduce emissions. Results were released in the 3rd quarter of 2007 and are available in a publication entitled *A cost curve for greenhouse gas reduction.* Mckinsey also started up the development of national abatement investigations (for Germany, US, UK, Japan, Australia and some other countries). Mckinsey will be publishing a second version of report on global carbon abatement model next spring with much more regional disaggregation. This new version will be more robust in terms of data as compared to the previous publication. Investments will also be covered in this version in addition to cost.
- The **London-Accord** project will prepare a reference guide for investors on climate change solution, including projection of future costs and potential impact on portfolio for release at the end of November.
- **OECD ENV-Linkage model** projects investment in 26 sectors to 2050 (based on GTAP database).
- **IEA** does energy related $CO_2$ projections to 2030 using a 21 region model. It publishes the *World Energy Outlook* that includes projections by fuel by country and investment projections under various policy scenarios. Work on a 450 ppm stabilization target scenario has recently been initiated.
- The **International Institute for Applied Systems Analysis (IIASA)** is working on long-term scenarios exercises with a bottom up energy model that maps the entire energy sector in 11 world regions to the 2100 horizon. The model is currently linked with a forestry model and includes non-$CO_2$ gases.
- **The UK government** is doing some work on modeling of investment and financial flows for climate change that will be made available in the next few months.

Lessons and challenges:

- Two main actors need to be targeted to improve projection of investment and financial flows: 1) companies who directly invest in projects and 2) financial

institutions. From the companies' perspective, the potential number of projects which can be pursued is beyond the capacity of the companies in terms of finance, technology availability and human resources. From the financier perspective the key issue is how to select the projects in order to constitute portfolios that are robust under different scenarios.

- When presenting the results of modeling work, more context needs to be provided. The assumption made need to be as explicit as possible when doing projections and disseminating the results.

Recommendations for next steps:

- Pursuing work at a more disaggregated level to better understand the action required and implications at the national level.
- More work needs to be done on the performance curves and to understand how technologies will develop in terms of cost per megawatt of installed capacity and per ton of $CO_2$ abatement potential, as this drives a lot of uncertainty around the investment that will be needed and the impact of subsidies, etc.
- Financial models are based in shorter term horizons than climate change, it is important to consider how to incorporate longer term horizons.
- Incorporation of investment flows in the models.
- Improving the knowledge about barriers and constraints could make the financial flows and the construction of portfolios more predictable.
- Future work on investment and financial flows should focus more on investment on the consumer side (demand side or consumer investment pattern change), e.g. on energy efficiency, which could be most cost effective. More work needs to be done to understand how consumer investment patterns need to change to move from one scenario to another.
- Case studies looking at some current significant decisions that are being taken by companies could improve understanding of projected investment and financial flows.
- It could be envisaged that countries be requested to report on their investment/type of technologies used and this would allow prediction of GHG trajectories and whether commitments are likely to be met or not.

## 3. How to improve the assessment of needs by developing countries themselves?

The UNFCCC background paper on investment and financial flows was undertaken using a top-down approach and analysing data on needs based on available statistics. An important challenge was to integrate the consideration of needs as expressed in terms of priorities by Parties. While some priorities can be identified through NAPAs, TNAs and national communications, these are often not quantifiable.

Lessons and challenges:

- Currently there is a low level of awareness of the linkages between climate change and economic development in developing countries and awareness raising is needed.
- Substantial regional heterogeneity makes it necessary to conduct assessment at national level.

Recommendations for next steps:

- Internal coordination between agencies is key. What is needed is an effective and broad network of consultation in developing countries.
- Need to bring together those who work on disaster, development and climate change.
- Distinction needs to be made among developing country needs and contexts.
- Capacity building is crucial to involve local organizations to improve the assessment, particularly in LDC countries.
- Networking instead of creating new arrangements would facilitate the process.

- To improve the assessment of needs by developing countries themselves, or broadly to address climate change issues in developing countries, engagement of entities which are more powerful in the decision making process with regard to planning and financing could be crucial in the future. In particular, central banks, national statistics agencies, revenue services and investment planning and investment promotion agencies of developing countries need to be involved.
- Pilot assessments could be done to extract lessons learned and roll out procedure in all countries.
- Sub-regional institutions could be involved and support national ones.

## Session 2a. Specific areas where further analysis is needed on investment and financial flows for mitigation

This session focused on the identification of further needs for research and analysis relating to investment and financial flows for mitigation, particularly on assessments of technology R&D, energy subsidies, forestry mitigation options and costs and distribution of CCS.

### 1. Assessment of needs relating to R&D and deployment

Low-carbon technologies typically require R&D, support for early deployment and policies that expand the markets for such technologies. Appropriate investment and financial incentives are needed for each technology at various stages of commercialisation. As outlined in the UNFCCC study, different sources of financing may play different roles at each of these stages. Most of the literature assessing investment and financial flows for technology, and in particular R&D, is based on top down approaches and the quantitative relation between R&D expenditure and final outcome has great uncertainty.

Participants agreed that a strong carbon price would help the support R& D and deployment as it would provide an important signal and reduce uncertainties. It will however not be a panacea and there is a need to increase expenditure in R&D by 6 to 10 billion per year and to enhance R&D leadership from the public sector. In fact, R&D expenditures are declining due to various reasons such as the liberalization and reforms followed by privatization and mergers and acquisitions in the electricity sector.

Lessons and challenges:

- With market reform and liberalization, R&D data have become more sensitive and R&D collaboration decreased significantly because of competitiveness issues in private sector.

Recommendations for next steps:

- There is a need to expand the carbon market and to enhance R& D cooperation by aggregating the financing available for technologies. Programme-based instruments are needed and some banks are starting to gain experiment with these. There is a need to develop methodologies to aggregate projects to replace a specific technologies to drive down the cost.
- It would be useful to better understand the different cost components of technology in greater detail and to identify where further reductions in costs are possible. There is not much effort at this level at present.
- There is a need to better understand how equipment manufactures and suppliers react to liberalization and their level of spending on R&D.
- Modelling can help to identify areas where incremental cost reduction of technology would be possible with further R&D expenditures.

- Policy, taxes and other incentives structure could be explored to foster R&D in clean tech sector.

## 2. Assessment of energy subsidies

Energy subsidies remain large in many countries. Subsidies that encourage the production and use of fossil fuels inevitably increase greenhouse-gas emissions and run counter to efforts to mitigate climate change. Reforming energy subsidies, as part of a broader process of reform of energy pricing and taxation, could play a central role in government efforts to mitigate greenhouse-gas emissions. Whatever the precise design of reform policies, politicians need to convince the general public of the overall benefits of cutting environmentally harmful subsidies and to consult widely with stakeholders in formulating reforms.

Important initiatives/sources of data:

- **International Institute for Sustainable Development (IISD) global subsidies initiative** aim at improving the public understanding of subsidies and to improve the international effort on measuring and reporting on them. It has recently published studies on subsidies to biofuels.
- **The German Technical Cooperation (GTZ)** regularly reports on end use prices of kerosene and gasoline from which price-gap consumption subsidies can be estimated.

Lessons and challenges:

- Subsidies to energy production and to R&D are difficult to estimate. Work on this matter is relatively ad hoc and not pursued on a regular basis.
- Institutional arrangements were identified as one of the major reasons why data on energy subsidies are not being estimated and reported regularly. For instance, members of the International Energy Agency governing body do not have a strong interest in publishing data on subsidies from their countries.

Recommendations for next steps:

- Apart from the energy sector, agriculture (biofuels in particular) is an important sector to be considered in terms of subsidy and potential GHG mitigation. Large subsidies are directed towards biofuels in OECD countries despite the fact that large scale production of biofuels may not be renewable and $CO_2$ neutral.
- More attention needs to be given to how subsidies are being provided not only on how much.

## 3. Assessment of forestry mitigation options and costs: Comparison of assumptions and methodologies

Lessons and challenges:

- Differences in methodologies give rise to very different carbon reduction potential and to different evaluations of the investment needed. In particular, mitigation options considered differ in terms of the assumptions made and the timeframe considered.
- Low quality and heterogeneous data on forestry (e.g., carbon stock), except in the case of some countries and large variations in the annual data on forestry, represents a major challenge to the determination of a baseline.
- Different kinds of mitigation measures are being looked at, such as, reforestation and afforestation. However, restoration of degraded forest has not received much attention yet.
- Definition of forest varies from 10% to 100% crown cover and the difference is not well captured by models.

- A wide range of assumptions needs to be made and this makes it difficult to obtain precise estimates even with the use of dynamic models.
- The use of dynamic models give impressive results from a scientific point of view but always provide a very large range of estimates.
- In the forestry sector, a high carbon price is not directly linked to more carbon stock. Access to land, shelter and food are also very important factors that are difficult to take into account in models.
- Given the important variation in opportunity cost across the regions, models produce a wide range of estimates on the cost of mitigation through Reducing Emissions from Deforestation in developing countries (REDD).
- Mitigation potential varies greatly from one year to the next depending on various factors.
- The cost of avoided deforestation varies greatly from country to country as this cost depends on the opportunity cost of avoided deforestation, which differs greatly across regions.

Recommendation for next steps:

- Need to establish baselines.
- Need to look at all of the mitigation potential in the forestry sector and start to gain concrete experience (demonstration projects) in considering regional differences among countries and in optimizing the benefits for local stakeholders.
- Need to have a better understanding of land tenure in developing countries and the regional differences.
- Need to create a linkage between the international forestry negotiations and the instruments for financing mitigation in the forestry sector. Better cooperation between institutions will reduce transaction costs.

## 4. Assessing the distribution of carbon dioxyde capture and storage (CCS) at regional level session

CCS can play a key role in mitigating climate change in the mid and long term. However, most of relevant assessments also show that knowledge of CCS costs and potential is still limited.

Lessons and challenges:

- The deployment of CCS is proving to be very challenging despite the existence of proven technologies. The organisational aspect is very challenging.
- CCS is a technology that needs to be politically induced – in the absence of political will the technology will not be deployed.
- Future assessment of CCS will need to look at non – technical barriers.

Recommendations for next steps:

- Need for a better understanding of storage capacity and accessibility.
- Legal aspects need to be better understood to ensure that a proper legal framework is in place for the deployment of CCS.

## Session 2b. Specific areas where further analysis is needed on investment and financial flows for adaptation

This session focused on the identification of further needs for research and analysis relating to investment and financial flows for adaptation, particularly on assessments of linkages between cost of damage and adaptation cost, assessment of the adaptation cost and needs for investment and financial flows in the water sector, coastal zone, agriculture, forestry and fishery, ecosystems and on assessment of the linkages between adaptation and mitigation.

### 1. Methodological issues on assessing the cost of damage and its linkages to adaptation cost

Important initiatives/sources of data:

- **Munich Re database** on the frequency of weather related catastrophes is available for research purposes.

Lessons and challenges:

- There is a limited amount of data available to estimate the damage on global and regional scale.
- There is an increase in the number of people living in vulnerable areas and losses have tripled over the last five years. The most vulnerable populations across the globe are in developing countries and have the least adaptation capacity.
- Different insurance and compensation mechanisms are required for foreseeable and unforeseeable risks of climate change to help adaptation.

Recommendation for next steps:

- There is a need to assess the cost of damage by climate change and understand how much of this damage could be insured.
- Indirect cost of damages should be accounted in estimating total cost of damage by extreme weather events and catastrophes, as these indirect costs could be very significant.
- The information reported on national circumstances should be strengthened to provide more information for assessment of country and region specific risks.

### 2. Next steps on assessing the adaptation cost and needs for investment and financial flows in the water sector, coastal zone, agriculture, forestry and fishery, ecosystems

**Water Sector:**

Important initiatives/sources of data:

The **UNDP** is conducting country level studies to estimate the cost and economics of adaptation and could provide useful insights for policy makers and the global climate change research community.

Lessons and challenges:

- There is a lack of accurate regional, watershed specific data on the potential impact of climate change on the water sector and there is a very large uncertainty.
- The need to improve demand side water management was also discussed. Investment in water management technologies and promoting a culture of conservation was considered as key.

Recommendation for next steps:

- It was suggested that studies on the water sector should be expanded to capture the investment and financial flows needed to cope with extreme events, water quality, demand management and capacity building measures.
- It was mentioned that accurate water pricing and tradable allowances for efficient water use and management could drive private investment in this sector to assist public funding, which is a predominant source of financing for water sector.
- The analysis of climate change impacts could be improved if it was conducted at watershed level and then integrated at the national or regional level.
- A global audit of water infrastructure vulnerability to extreme events, and to the short and long-term effects of climate change was suggested.

**Coastal Zones:**

It was highlighted that this is one of the only sectors in which we can already notice some concrete adaptation measures being taken. Experiences to date could serve as a good knowledge base.

Lessons and challenges:

- There are a lot of possible adaptation measures in this sector but only a few options are now understood.
- The status of knowledge on investment and financial flows in this sector is currently very low. We know more about how much is spent on hazard adaptation or relief than we know about how much is spent to adapt to expected climate change.

Recommendation for next steps:

- It was suggested that national studies for coastal zone adaptation and investment and financial flows estimates could be conducted. A lot could potentially be learned from such exercises.
- Approaches for estimating risk by insurers and the dynamic integrated vulnerability assessment (DIVA) model could be integrated for better-cost estimations of adaptation.

**Agriculture, Forestry and Fisheries:**

Lessons and challenges:

- The main adaptation methods are research, extension and capital investment. Climate change will place a new burden on research and extension with the need to invest in research to enhance productivity in systems negatively affected by climate change.
- The panelists discussed the complexity of estimating adaptation costs in 2030 in this sector in particular, as the life of assets is relatively limited. Much of the adaptation could be automatic as the short-lived assets are replaced. By 2030, assets are likely to be replaced a few times so it can be expected that much of the facility based adaptation will automatically incur with normal operations.
- Most of the adaptation work done to date assumes that adaptation of practices and varieties is free, however substantial investment will be needed in research and extension and in new facilities.
- Adaptation is widespread and occurring on a continuing basis in this sector and it is difficult to distinguish what fraction of this adaptation will be related to climate change.

Recommendation for next steps:

- There is a need for more investment and financial flows for research and extension efforts to effectively and timely address the climate change impacts.

- Most financial models look at the national level. Analysis at the sub-national level needs also to be further elaborated.
- There is a need for data on investment and financial flows for research and extension efforts.
- Need for monitoring and better data systems to better understand what is happening.
- A special report should be done on adaptation possibilities and costs across sectors building upon UNFCCC work.

**Ecosystems:**

Lessons and challenges:

- It was highlighted that there is an information and data gap for assessing adaptation cost sand a need for investment and financial flows in natural ecosystems. There is a need to scale up funding and financial support to enhance research on adaptation cost estimation at the national level in developing countries.
- Participants noted the need to be cautious in aggregating sectoral numbers to obtain a global adaptation cost estimate, which may include double counting given the strong link between natural ecosystem conservation and other sectors.

Recommendation for next steps:

- It was suggested that an approach based on the geography of natural ecosystems could be considered for conducting adaptation cost analysis in addition to analysis at the national level.
- It was suggested that the issue of perverse subsidies should be analyzed to estimate what amount of resources could be diverted from these subsidies towards of natural ecosystem conservation.

## 3. Assessment of linkages / benefits between I&F flows for adaptation and mitigation

The panelists made a quick review of potential synergies, co-benefits and negative implications of mitigation and adaptation efforts.

Several areas of potential synergies were identified, including:

- Global mitigation is beneficial to adaptation by potentially reducing global warming and reducing the need for adaptation.
- CDM: opportunities are unbalanced across regions and ancillary adaptation benefits are likely to be small.
- A wider tax on emissions trading (mitigation) could help to raise resources for adaptation.
- Integrated research on climate change issues can often provide useful information for both adaptation and mitigation.
- Increased water storage and better land and forest management undertaken for adaptation purpose would be beneficial to the mitigation effort.

It was also highlighted that some mitigation activities can have a negative impact on adaptation and vice versa. In particular, the increasing use of biofuels or the politically driven use of renewable energy where it is not the most suitable option were cited.

It was mentioned that tapping only the win-win opportunities would not be enough to address adaptation needs.

It was highlighted that adaptation measures need to be integrated in the development agenda at the national level and that an integrated approach for assessing, planning and financing of adaptation measure is required.

## Session 3. Scaling financing to address climate change

The session focused on the examination of various proposals made over the last few years to facilitate the shift, the scaling up and the better allocation of available resources for climate change mitigation and adaptation.

### 1. Potential of the carbon markets including levies on ET and JI

The results of the investment and financial flows project with regard to the potential of the carbon market and factors affecting demand and supply were presented. It was highlighted that in 2010, Annex-I Parties' demand for carbon credits could reach 400-600 Mt of $CO_2$ eq per year. Supply from the CDM and JI is expected to be of this order of magnitude during the Kyoto period.

The high-demand scenario for carbon credits in 2030 has been estimated at 4000-6000 Mt of $CO_2$ eq per year. A low-demand scenario would bring demand down to the level estimated for the Kyoto period of 400-600 Mt of $CO_2$ eq per year.

It was also estimated that, although it could generate a significant level of additional resources, the 2 per cent levy on carbon credits for adaptation financing alone would not be sufficient to generate enough revenue to cover the estimated need for adaptation in 2030, even when considering the high demand scenario.

### 2. Use of national policies to promote private sector investment

Participants provided insights on the need for convergence of international public policy towards national policies and private sector response.

**In its annual report entitled "Doing Business" the IFC** surveys the ways in which governments foster or hinder investments within their countries. The report presents the attractiveness of country for private investment based on objective information of variables.

Referring to the experience of the World Bank in investing in new solar and bio-gasifier technologies, it was noted that investment finance and risk capital are not guarantees for the successful deployment of new clean energy technologies. On the other hand, extending credit lines to smaller local banks and building capacity on how to evaluate opportunities in their market has proven a more successful and replicable approach. Helping government to create favorable market conditions to increase market share of energy efficient product has also proven to be an effective and more sustainable approach.

Participants stressed the need to focus attention at the small-scale level supported by government policies to generate attractive risk-adjusted returns for new clean technologies.

Private capital would go to countries with adequate risk adjusted returns. Hence, governments can approach the issue through policies that improve the returns or by reducing the risks. As it is projected that a high fraction of the required investment to address climate change will come from private sector by 2030, the right mix of national policies is very important. These policies need to come about quickly to avoid making the wrong investments today given the long life of certain assets.

## 3. Renewable energy targets

The different policy measure employed by **EU members countries** to meet the renewable energy target of 20% were presented by EU representative such as 1) renewable portfolio standard for utilities, 2) feed-in tariffs for renewable technologies, 3) green certificates for promoting inter country trade of green electricity, and 4) tax exemptions for bio-fuels have been promoted to meet the renewable energy targets.

It was suggested that the extension of trade of green certificates to developing countries could be considered to expand support for clean energy and could be used as an innovative sources of financing for renewable energy in developing countries. However, this approach is likely to lead to limited results as normally standard schemes are promoted for local purposes (local market and local environment benefits). The idea of combining and bundling different renewable energy technologies, like bundling hydro with wind power generation as one power generation utility, could be helpful to make renewable energy more competitive in the market. Some participants expressed concerns that mandatory renewable targets may not be very cost effective.

## 4. Carbon tax and allowances

The similarities and contrasts between carbon taxes and a cap and trade system were presented. In a tax system there is fixed price of carbon while emission fluctuates while in cap and trade system, there is a limit on emissions with fluctuating carbon prices. Both systems have merits and drawbacks, depending on national and sectoral circumstances. Some participants believed that an optimal use of both options is required to bring emissions down. A representative from Switzerland raised different aspects of the operationalization of global carbon taxes and the difficulties in earmarking the revenue for adaptation efforts.

## 5. Auction of allowances for international aviation and marine emissions

The EC presented an overview of grand fathering and auctioning of allowances in EU-ETS. It was highlighted that the use of revenue from auctioning has to be left to respective countries but that it could in theory constitute a useful source for funding adaptation.

The potential introduction of emissions from aviation into the EU-ETS and earmarking of auction revenues for supporting other mitigation activities or adaptation were discussed. Germany highlighted that they are earmarking the auction revenues for climate change purposes and in particular for adaptation activities in developing countries. A participant highlighted the examples of France and Brazil which are charging taxes that are earmarked for AIDS, malaria and tuberculosis prevention and suggested that something could be learned from such similar experiences.

## 6. Insurance for adaptation

It was highlighted that there is a growing interest among insurance companies, multilateral and NGOs for using insurance for sharing risks related to climate change variability and extreme events. The need to transferring increasing climatic risk to the broad financial market and hence generate incentives for adaptation was highlighted. It was stressed that private insurance companies may be supported by public mechanisms, like public private partnerships that have proven successful but that the competitiveness of insurance industry should not be distorted by perverse subsidies, which may send wrong signals. Innovative insurance products like indexed-based micro insurance instruments and dissemination of meteorological information should be promoted and co-financed. The international community may support re-insurance structures to absorb the upper limit of the risks.

It was highlighted that the assessment and quantification of climate change risk could bring the right signal for effective long-term risk mitigation efforts. There are successful examples at national and regional levels from which key lessons could be used for the design of international support for climate change insurance. It was suggested that funding in support of global insurance mechanisms could be based on responsibility and capabilities of countries. However, it was recognized that there is also a need for information and data sharing along with improving access to insurance products.

## 7. International Air Travel Adaptation Levy

It is estimated that the levy could address to a large extent the deficit in adaptation funding. It is estimated that this option could generate about 10 billion dollars/euros per annum for adaptation with an average levy of 5 dollars or euros per person. In principle, the levy could be based on emissions per passenger or on passenger's capacity to pay based on ticket price or on a combination of both. It was also argued that levy could work well on solidarity principle as emissions could be more efficiently and economically be handled by a cap and trade system. In principle, operation and disbursement of this levy could be routed through the adaptation fund.

It was highlighted that there is a need to further explore this option with regards to its effect on sectoral competitiveness, its relationship with a levy on bunker fuels, the potential of applying it on domestic flights given the high growth rate in domestic flights and with the selection of countries contributing to this levy as well as with regards to its potential governance arrangements. One representative expressed concern of effect on tourism of small island states by introduction of new levy and taxes on aviation industry.

## 8. Potential of reporting, voluntary commitment by private sector and climate change indices

The session started with a brief introduction by a representative from **ABN AMRO** of the Equator Principles that private sector banks have adopted to assess environmental, social and governance issues when financing projects. The principles have become a standard rather than the minimum-qualifying criterion for project financing risk management for environmental, social and governance issues. It does not directly influence the investment and financial flows going to climate change related sectors.

It was proposed that there is a scope to attempt to link the Equator Principles to other lending and risk financing operations of financial institutions and to explicitly integrate climate change consideration into the environmental impact assessment process and the Equator Principles.

The **Carbon Disclosure Project (CDP)** is a secretariat for over 300 institutional investors, holding over USD 41 trillion in assets under management. CDP reports on carbon emissions and strategies related to climate change and assessment of climate change risk and opportunities of the world's largest listed companies. The initiative is based on the idea that carbon emissions cannot be managed, if they are not measured. The CDP is working on a global carbon accounting framework with the aim of supporting harmonization of variety of emission accounting techniques used by various agencies. On this, they are working with a consortium of corporation under the Climate Disclosure Standard Board convened under World Economic Forum to develop the framework.

A representative from **HSBC** presented its recently launched climate change indices representing stock market performance of companies developing technologies and services

for mitigation or adaptation to climate change. Indices provide information on the potential investment opportunities to investors and provide financial characteristics to the mitigation and adaptation opportunities for investors. The indices are meant to help with the identification of growth trends and emerging opportunities in these sectors. It was highlighted that there is a need for an enhanced reporting standard to link climate change mitigation and adaptation activities with financial parameters of profitability. It was also highlighted by participants that convergence of standards might be desirable but that the highest standard should prevail.

**WBCSD, the Carbon group and IETA** are working on voluntary carbon standards that will be launched before the end of 2007.

### 9. Scaling up and optimizing use of resources channeled though IFIs, the GEF and ODA by taking advantage of the synergies between development and climate change adaptation and mitigation

A representative from the **World Bank** highlighted the need for a programmatic approach to mitigation projects in order to scale up the size of the market and introduced two new carbon WB facilities for the post 2012 period and the need to assist countries in creating enabling environments. It was also highlighted that the WB is beginning to integrate climate change into its lending portfolio and to assist countries through respective country assistance strategies.

A representative from the **GEF** shared some information regarding the incremental cost financing approach and a business model to finance mitigation and adaptation projects. GEF leverages co-financing for the implementation of various mitigation projects with the view of promoting and facilitating expansion and replication after project closure. The experiences of pilot projects in various countries are being shared to facilitate replication. It was highlighted that efforts are under way to have similar financing models and replication strategies for adaptation projects but that more experience is needed to develop a most effective and efficient approach. There is also a need to work with all the stakeholders.

A representative from the **ADB** proposed greater emphasis on the risk-adjusted returns for private capital to be raised for mitigation efforts in developing countries. It brought forward the finding of the I&F project that a large fraction of investment and finance flows needs would come from private sources in 2030 and there is a need to promote investment friendly domestic policies and risk sharing instruments and assistance on part of MDBs.

On the role of ODA, a representative from the **OECD** expressed the need for the adoption of a programmatic approach for giving aid to recipient countries. There is a need for shifting the focus from project based tied aid to more budgetary support aligned to recipient country needs and requirements. There is also a need to scale up funding and harmonization of different funding sources to align with the impending needs of recipient countries to effectively tackle climate change impacts.

## Session 4. Conclusion

This session focused on the practical next steps that could be promoted under the UNFCCC and under other processes.

In this last session of the workshop participants made the following remarks and recommendations:

- For some developing countries ODA is key to the undertaking mitigation and adaptation activities in the future and in several sectors it would not be possible to rely on domestic and foreign private sector agents to make the necessary investment.

- Developing countries should be actively involved in the identification of needs.

- There is a need to undertake assessment at the national level.

- Regardless of any carbon price there is a need to focus on the development of low carbon technologies especially in the early stages of technology R&D and deployment.

- National conditions and characteristics including issues of governance are key to the creation of domestic capital and to attract foreign direct investment.

*Participants were invited to communicate with the UNFCCC secretariat and with each other's their views on the next steps to enhance understanding of current and projected investment and financial flows to address climate change and for scaling up the level of resources.*

# ANNEX I

## Summary of results from participants' survey

**Regarding the collection and dissemination of data on investment and financial flows to address climate change:**

- The vast majority of participants believe that all the working themes proposed in this session are crucial or important to follow up on. However a higher percentage of participants (67%) believe that it is crucial to improve the analysis and quantification of needs by developing countries themselves.
- MDBs and IFIs particularly World Bank, UN agencies, and National agencies were mentioned as organizations that could be willing and capable for pursuing the work mentioned above.

**Regarding the priority areas for further analysis related to investment and financial flows for mitigation:**

- The vast majority of participants believe that all the working themes proposed in this session are crucial or important to follow up on. However, 23.9% believe that improving the assessment of the distribution of carbon capture and storage at regional level is not a priority.

**In terms of the priority areas for further analysis related to investment and financial flows for adaptation**

- Improving the assessment of the cost of damage and its linkages to adaptation cost is identified as the most crucial area (57.4% of participants).
- The majority of the participants believe that improving the assessment in sectoral level and linkage/synergies between I&F flows for adaptation and mitigation are important or crucial.

MDBs and IFIs particular World Bank, UNFCCC and UN agencies and several academic institutions were suggested as organizations that could be willing and capable for pursuing the work mentioned above.

**With respect to the most promising tools that could be used to scale up financing to address climate change**

- The vast majority of participants (above 90%) believe that the carbon markets including levies on emission trading and joint implementation and the use of national policies to promote private sector investment are promising or very promising.
- A large amount of participants believes potential of voluntary commitment by private sector and climate change indices (55.3%) and international Air Travel Adaptation Levy (38.3%) are not so promising.
- MDBs, financial and academic institutions are nominated as organization that could willing and capable to pursue the necessary analytical work needed to implement specific measures/tools by some participants.

**Most of participants (83.8%) believe a task force/network on investment and financial flows related to climate change mitigation and adaptation should be created, while others think it depends on the outcome of Bali negotiations.**

**ANNEX II**

**List of Participants**

| Name | Organisation |
|---|---|
| Mr. Francis Condon | ABN Amro |
| Mr. Maurik Jehee | ABN Amro (Real) |
| Mr. Nick Silver | Actuary |
| Mr. Yogesh Vyas | African Development Bank |
| Ms Mariana Alvarez Rodriguez | Argentina |
| Mr. Josh Carmody | Asian Development Bank |
| Mr. Chester Cunningham | Australia |
| Mr. David Simmons | Benfield |
| Mr. Eduardo Bandeira de Mello | BNDES |
| Mr. Raphael Azeredo | Brazil |
| Ms Denise Seabra | CAIXA |
| Mr. Adailton Trindade | CAIXA |
| Ms.Sushma Gera | Canada |
| Ms Susan Weston | Canada |
| Mr. Normand Tremblay | Canada |
| Ms Joanna Lee | Carbon Disclosure Project |
| Ms Kirsty Hamilton | Chatham House |
| Mr. Steven Gray | Climate Change Capital |
| Mr. Jens Petersen | Denmark |
| Mr. Frode Neergaard | Denmark |
| Ms Trine Rask Thygesen | Denmark |
| Mr. Henrik Duer | Denmark |
| Mr. Asger Jarnak | Denmark |
| Mr. Martin Enderlin | EcoSecurities |
| Mr. Jaquelin Ligot | European Bank for Reconstruction and Development |
| Ms Astrid Ladefoged | European Commission |
| Mr. Artur Runge-Metzger | European Commission |
| Mr. Juergen LeFevere | European Commission |
| Ms Marjo Nummelin | Finland |
| Ms Fatou Gaye | Gambia |
| Mr. Christopher Bals | Germanwatch |
| Ms Carolin Zerger | Germany |
| Ms Nicole Wilke | Germany |
| Mr. Jonathan A. Allotey | Ghana |
| Ms Bonizella Biagini | Global Environment Facility |
| Mr. Angus Friday | Grenada |
| Mr. Joaquim de Lima | HSBC |
| Ms. Rajasree Ray | India |

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|---|---|
| Mr. Amnu Fuadiy | Indonesia |
| Mr. Laurens Bouwer | Institute for Environmental Studies |
| Ms Michela Beltracchi | International Emissions Trading Agency |
| Ms Laura Cozzi | International Energy Agency |
| Ms Khalida Bouzar | International Fund for Agricultural Development |
| Ms Silvia Donato | International Fund for Agricultural Development |
| Ms Shilpa Rao | International Institute for Applied Systems Analysis |
| Mr. Reinhard Mechler | International Institute for Applied Systems Analysis |
| Mr. Ronald Steenblik | International Institute for Sustainable Development |
| Mr. Clifford Mahlung | Jamaica |
| Mr. Rainer Durth | Kreditanstalt fuer Wiederaufbau Foerderbank |
| Mr. Jan Peter Onstwedder | London Accord / BP |
| Mr. Per Anders Enkvist | Mc Kinsey |
| Mr. Benito Jimenez | Mexico |
| Mr. Viktor Nikolae | Moldova |
| Mr. Peter Hoeppe | Munich Re-Insurance |
| Mr. Patrick Todd | Netherlands |
| Mr. Paul Hassing | Netherlands |
| Mr. Leif Ervik | Norway |
| Mr. Bjorn Brede Hansen | Norway |
| Mr. Thomas Myhrvold-Hanssen | Norway |
| Mr. Philip Bagnoli | Organisation for Economic Co-operation and Development |
| Mr. Shardul Agrawala | Organisation for Economic Co-operation and Development |
| Ms Kate Raworth | Oxfam |
| Mr. Francisco Fracchia | Paraguay |
| Mr. Domenic Carratur | Rabobank Netherlands |
| Ms Virginia Sonntag-O´Brien | REN 21 / UNEP - SEFI |
| Mr. Nenad Ilic | Serbia |
| Mr. Fredrik von Malmborg | Sweden |
| Mr. Jose Romero | Switzerland |
| Mr. Khairullo Murodov | Tajikistan |
| Mr. Philip Gwage | Uganda |
| Mr. Alejandro Kilpatrick | UNCCD - Global Mechanism |
| Mr. Alon Carmel | United Kingdom |
| Ms Hannah Ryder | United Kingdom |
| Mr. Neil McMurdo | United Kingdom |
| Ms Tamsin Vernon | United Kingdom |
| Mr. Aditi Maheshwari | United Kingdom |
| Mr. Astrit Sulstarova | United Nations Conference on Trade and Development |
| Ms Jennifer Frankel-Reed | United Nations Development Programme |
| Mr. Joakim Harlin | United Nations Development Programme |
| Mr. Ed Fendley | USA |
| Mr. Mustafa Hussain | World Bank |

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|---|---|
| Ms Kathrin Gutmann | WWF |
| Ms Ghazal Badiozamani | Expert |
| Ms Merylyn Hedger | Expert |
| Ms Pam Berry | Expert |
| Mr. Adam Kirkman | Expert |
| Mr. Alain Lafontaine | Expert |
| Mr. Alan Miller | Expert |
| Mr. Andrew Dlugolecki | Expert |
| Mr. Bruce McCarl | Expert |
| Mr. Chris Greenwood | Expert |
| Mr. Chris Hendriks | Expert |
| Mr. Dennis Tirpak | Expert |
| Mr. Emilio Lèbre La Rovere | Expert |
| Mr. Hernan Carlino | Expert |
| Mr. Ian Burton | Expert |
| Mr. Ian Johnson | Expert |
| Mr. Ian Noble | Expert |
| Mr. Irving Mintzer | Expert |
| Mr. Jayant Sathaye | Expert |
| Mr. Johannes Heister | Expert |
| Mr. John Nyboer | Expert |
| Mr. Jose Garibaldi | Expert |
| Mr. Juergen Blaser | Expert |
| Mr. Robert Nicholls | Expert |
| Mr. Tahar Hadj-Sadok | Expert |
| Mr. Tooraj Jamasb | Expert |
| Mr. Youba Sokona | Expert |