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UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

AD HOC WORKING GROUP ON LONG-TERM COOPERATIVE ACTION UNDER THE CONVENTION
Third session
Accra, 21–27 August 2008

Item 3 (a–e) of the provisional agenda
Enabling the full, effective and sustained implementation of the Convention through long-term cooperative action now, up to and beyond 2012, by addressing, inter alia:
A shared vision for long-term cooperative action
Enhanced national/international action on mitigation of climate change
Enhanced action on adaptation
Enhanced action on technology development and transfer to support action on mitigation and adaptation
Enhanced action on the provision of financial resources and investment to support action on mitigation and adaptation and technology cooperation

Ideas and proposals on the elements contained in paragraph 1 of the Bali Action Plan

Submissions from Parties

1. The Ad Hoc Working Group on Long-term Cooperative Action under the Convention (AWG-LCA), at its second session,[1] invited Parties to submit to the secretariat ideas and proposals and, where appropriate and to the extent possible, specific textual proposals on the elements contained in paragraph 1 of the Bali Action Plan,[2] taking into account the interlinkages among the elements and the specific subparagraphs under each of the elements, in order to focus the consideration of all the five elements by the AWG-LCA.

2. The secretariat has received 14 such submissions. As requested by the AWG-LCA, they have been posted on the UNFCCC website.[3] In accordance with the procedure for miscellaneous documents, these submissions are attached and reproduced[4] in the language in which they were received and without formal editing. The secretariat will continue to post on the relevant web page the submissions received after the issuance of the present document.

3. Submissions received from accredited intergovernmental organizations will be compiled in document FCCC/AWGLCA/2008/MISC.3. Submissions received from non-governmental organizations will, in line with established practice, be posted on the UNFCCC website at <http://unfccc.int/parties_and_observers/ngo/items/3689.php>.

[1] FCCC/AWGLCA/2008/8, paragraph 25.
[2] Decision 1/CP.13.
[3] <http://unfccc.int/meetings/items/4381.php>.
[4] These submissions have been electronically imported in order to make them available on electronic systems, including the World Wide Web. The secretariat has made every effort to ensure the correct reproduction of the texts as submitted.

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* These submissions are supported by Croatia, Turkey, Albania, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia, Montenegro and Serbia.

PAPER NO. 1A: FRANCE ON BEHALF OF THE EUROPEAN COMMUNITY AND ITS MEMBER STATES

Mitigation, including technology and finance

SUBMISSION BY FRANCE ON BEHALF OF THE EUROPEAN COMMUNITY AND ITS MEMBER STATES

This submission is supported by Croatia, Turkey, Albania, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia, Montenegro and Serbia

Paris, 30 July 2008

3rd session of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention (AWG-LCA 3)
Accra, 21-27 August 2008

Subject: Mitigation, including technology and finance

1. France, on behalf of the European Community and its Member States, welcomes the opportunity to submit views, ideas and proposals on the elements contained in paragraph 1 of the Bali Action Plan (BAP). In this submission, the EU outlines views, ideas and proposals on enhanced action on mitigation of climate change (paragraph 1(b) of the BAP), including views on the cross-cutting elements of enhanced action on technology development and transfer to support action on mitigation (paragraph 1(d)) and on the provision of financial resources and investment to support action on mitigation (paragraph 1(e)).

2. In addition to this submission, the EU will issue two separate submissions on **sectoral approaches** (BAP paragraph 1(b)(iv)) as well as on **policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries** (BAP paragraph 1(b)(iii)).

1. Shared vision and mitigation

3. For the EU the shared vision is an overarching element which is essential to get the world on a pathway to a low carbon and climate resilient society: it should provide a clear statement of political will, guidance and greater clarity for investment decisions that need to be taken today in all areas to get us on this pathway.

4. The EU believes that the shared vision should translate the ultimate objective as defined in Art. 2 of the Convention into a common and shared understanding on putting the world on a pathway towards a low carbon society that keeps temperature increase below 2°C above pre-industrial levels and thereby avoids dangerous climate change.

5. For the EU the move towards a low carbon society is one that also incorporates sound economic and development policies. The move towards a low carbon society could therefore be framed as a climate, energy and development investment programme for the first half of this century that will pay off in many ways during the coming decades, economically as well as in terms of security, stability, and the environment.

6. We will put forward a submission on this before Poznan, addressing why an ambitious long term goal for global emission reductions is required to inform short term action; how it contributes to the sustainable development of all parties and how it relates to the building blocks of the BAP. However, at this time we would wish to emphasis the positive contribution which a globally agreed long term goal can make to informing investment and research decisions made by both the private and public sectors over the coming decade.

2. Enhanced mitigation action by developed and developing countries (BAP paragraphs 1(b)(i) and (ii))

7. In line with the Convention, the Bali Action Plan recognises the principle of common but differentiated responsibilities and respective capabilities. With regard to enhanced action on mitigation, the Bali Action Plan therefore makes a clear distinction between commitments or actions for developed countries, including QELROs, and actions by developing countries. The EU recognises this distinction.

8. The EU considers that a key issue to explore under the BAP is what the principle of common but differentiated responsibilities and respective capabilities means **for national appropriate mitigation action between and within groupings**, with a view to enhance fairness and effectiveness of the climate regime under changing national and international circumstances.

9. In the light of this, the EU wants to underline that **all developed countries have to take the lead.** This requires commitments by the group of developed countries in the order of 30% by 2020, consistent with the range of 25-40% by 2020, compared to 1990, as outlined by the IPCC AR4. The AWG under the Kyoto Protocol is addressing this issue, but the AWG-LCA will have to address the issue of **comparability and of timescales,** taking into account the shared vision and the urgency of mitigation action.

10. **Nationally** appropriate **mitigation actions by developing countries** under the BAP could take several forms. These could include among others:

- National low carbon development plans that result in ambitious deviations of emissions from business as usual of that Party, including for instance specific energy policies aimed at improving the carbon and energy intensity
- Increased participation in the carbon market through e. g. sectoral trading and sectoral crediting mechanisms (see also EU's views on sectoral approaches in separate submission)
- Sustainable development policies and measures (SD-PAMs).

11. The EU welcomes the examples put forward by several parties during previous sessions of this AWG on the type of national actions that they have already implemented to mitigate climate change. The EU would like to discuss how further action could be put forward by different developing countries, how actions can be measured, reported and verified. These actions need to be differentiated between countries and among sectors, according to criteria to be explored.

12. The EU recognises that this action should be appropriately supported (in terms of technology, financing and capacity building) by developed countries, by the global carbon market and by other means, taking into account Parties common but differentiated responsibilities and capabilities. As indicated in the BAP we will need to see how this can be measured, reported and verified.

13. The EU fully agrees with the views stated by many Parties that due to their special circumstances and limited capabilities and responsibility for GHG emissions, **Least Developed Countries** should not have to take on any mandatory action. However, in addition to existing instruments such as the current CDM,

which should be improved, voluntary contributions such as SD-PAMs should be encouraged and supported.

14. The AWG-LCA should explore how such national mitigation actions by developing countries, in particular those **from advanced developing countries and major emerging economies**, could lead to a substantial deviation from baseline emissions by 2020 by developing countries, in line with the assessment of the IPCC. This, together with emission reductions of developed countries in the order of 30% by 2020, consistent with the range of 25-40% by 2020 from 1990 levels, as outlined by the IPCC AR4, would be in line with the objective of peaking global emissions before 2020 and achieving global emission reductions of at least 50% by 2050.

15. The EU would expect that in particular advanced developing countries would put forward national climate action plans, that indicate what (additional) nationally appropriate mitigation action they could implement unilaterally in line with their common but differentiated responsibilities and capabilities, and what further actions they could take with the support of developed countries.

3. Technology in relation with mitigation

16. In respect to the technology issue of the mitigation agenda, the EU suggests that a Copenhagen agreement would include the following commitments by Parties, complementary to commitments under Articles 4.1 and 4.5:

- Developed country parties would **do more to support existing and new financing** instruments **and tools**, including assistance to human and institutional capacity
- Developing country parties would **adopt appropriate policies and measures** to create enabling environments, in particular for attracting domestic and international investment.

17. In addition, the EU recognises the **need for an effective institutional and organisational arrangement coordinating, supporting, enabling and managing the activities related to technology**, including the recognition of activities and commitments undertaken by Parties and other actors, both within and outside the Convention.

18. **Sector technology oriented agreements** that should guide and regulate technology-related cooperation within and outside the UNFCCC in some key areas such as:

- agreements on policies and measures, including energy efficiency related standards
- international R&D and large-scale demonstration cooperative projects
- knowledge sharing platforms
- deployment schemes and roadmaps.

4. Financing in relation with mitigation

19. In respect to possible instruments for **financing of mitigation**, the EU:

- Has already expressed its commitment to scale-up and mobilise financial and investments flows and optimise existing ones as part of a global and comprehensive Copenhagen agreement
- is considering with interest proposals that Parties have put forward, which contain interesting elements and principles for action such as supporting national mitigation policies, methods for effort sharing and the role of public funding
- considers that financing mitigation should help to achieve equity (sharing of costs of action and effort-sharing), efficiency (channelling scarce resources to key areas at least cost), and predictability
- affirms that financial architecture should be coherent and ensure strong synergies between activities in the UNFCCC and related efforts.

20. In order to implement these principles and to look forward to efficient policies, the EU suggests that the AWG-LCA focuses its work on **developing a toolbox to deliver finance**:

- The carbon market has the potential to become a key vehicle for financing mitigation for all Parties. In this regard, the EU energy and climate package is designed to strengthen this market and may leverage considerable resources that can finance mitigation.
- Innovative financing mechanisms can assist in creating and strengthening the price on carbon while enhancing mitigation efforts. Innovative schemes which leverage particularly private investments and enhance mitigations efforts might be identified and further developed. The Global Energy Efficiency and Renewable Energy Fund (GEEREF) is for instance one such mechanism. Innovative financing sources could be used for mitigation action in developing countries, as also discussed in the EU submission on adaptation. For instance a part of the revenues of 15% of the EU-ETS allowances for aviation that will be auctioned from 2012 onwards should be used to finance mitigation actions in the EU and third countries, especially developing countries such as funding contributions to GEEREF and measures to avoid deforestation[1].
- The public sector and public finance in developed and developing countries will also play a key role to play in directing investment flows and mobilising additional finance. A range of domestic policies are at state's disposal: i.e. market based instruments, such as emission trading legislation, carbon taxes, policies like schemes reducing fossil fuel subsidies, energy efficiency standards, green procurement and targeted support programmes, in the form of loans or grants. The EU proposes that Parties may agree on cost-effective policies focused on specific sectors and that incentives be provided to assist in introducing these policies.

Conclusion: How to move work under AWG-LCA forward in Accra and beyond

21. The EU believes that the AWG LCA needs to focus its work during the next session in order to address all elements of the Bali Action Plan and to be able to report to COP14 for a productive stocktaking that gives an overview of all these elements. The EU proposes that the AWG LCA during its third session identifies the specific issues to be addressed under the mitigation building block, including supporting elements of technology and finance, in order to be able to agree to a substantive report by the AWG LCA to COP 14 in Poznan and to enable a decision on the work programme for 2009.

22. The EU looks forward to learning about other Parties' views on this important issue in Accra.

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[1] *European Parliament legislative resolution of 8 July 2008 on the Council common position for adopting a directive of the European Parliament and of the Council amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community (5058/2008 – C6-0177/2008 –* 2006/0304(COD)*)*

PAPER NO. 1B: FRANCE ON BEHALF OF THE EUROPEAN COMMUNITY AND ITS MEMBER STATES

Adaptation, including technology and finance

SUBMISSION BY FRANCE ON BEHALF OF THE EUROPEAN COMMUNITY AND ITS MEMBER STATES

This submission is supported by Croatia, Turkey, Albania, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia, Montenegro and Serbia

Paris, 30 July 2008

3rd session of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention (AWG-LCA 3)
Accra, 21-27 August 2008

Subject: Adaptation, including technology and finance

France, on behalf of the EC and its Member States, welcomes the opportunity to submit views, ideas and proposals on the elements contained in paragraph 1 of the Bali Action Plan (BAP). In this submission, the EU outlines views, ideas and proposals on enhanced action on adaptation (paragraph 1(c) of the BAP), including views on the cross-cutting elements of enhanced action on technology development and transfer to support action on adaptation (paragraph 1(d)) and on the provision of financial resources and investment to support action on adaptation (paragraph 1(e)).

1. Adaptation in the shared vision

For the EU the shared vision is an overarching element which is essential to get the world on a pathway to a low carbon and climate resilient society, and as such it is clearly also relevant to discussions on adaptation. The shared vision should provide a clear statement of political will, guidance and greater clarity for investment decisions that need to be taken today in all areas to get us on this pathway.

We will put forward a submission on this before Poznan, addressing why an ambitious long term goal for global emission reductions is required to inform short term action; how it contributes to the sustainable development of all parties and how it relates to the building blocks of the BAP, including adaptation.

2. Enhanced action on adaptation (BAP paragraph 1(c))

During the Bonn meeting of the AWG-LCA, the EU proposed a Framework for Action on Adaptation. This submission aims to elaborate on the elements of the framework to enhance adaptation action.
The EU notes that there is agreement on the fact that even with the most stringent mitigation measures, there will continue to be a need to adapt to climate change. This is a challenge facing all countries and especially countries that are particularly vulnerable to climate change, such as the least developed countries, small island developing states and African countries that are prone to drought, desertification and floods.

There is also recognition that **adaptation actions on their own are not sufficient and that these should be complemented by concerted efforts to mitigate climate change**. It is in this regard that the EU proposes a global temperature rise limit of 2 degrees Celsius above pre-industrial levels, which is essential to reduce risk and limit the need for adaptation.

Addressing adaptation needs will require responses that are tailored to the particular circumstances of the country or region affected and implemented at the local level. **Effective adaptation is thus the responsibility of every country and should be addressed at the local, national or regional level, complemented by international support**. There is a potential for the UNFCCC to play a key role and demonstrate greater leadership on mobilising adaptation action

While efforts have been made and continue to be made by governments and the international community to address adaptation, these remain largely inadequate as they are often fragmented, limited in their scope and not aligned with national development plans and strategies. The EU is of the view that **enhanced action on adaptation should strive for consistency and coherence with national development priorities and strategies**.

It is in this light that the EU has proposed a Framework for Action on Adaptation (FAA).

3. A FRAMEWORK FOR ACTION ON ADAPTATION (FAA):

The FAA would be a partnership between developed and developing country Parties to enhance the implementation of adaptation measures in order to strengthen resilience, reduce vulnerabilities and the negative impacts of climate change, while making full use of opportunities for sustainable development.

The framework would provide the arena to mobilise actions of Parties, the public and private sector, enable to prioritise adaptation actions and ensure effectiveness. It would provide leadership with regards to adaptation action. Agreeing a framework for action on adaptation (FAA) under the UNFCCC would bring to bear the important role the climate regime has in catalysing adaptation action. The FAA would also serve as a guide for the financial mechanism operating within the context of the UNFCCC, and be considered by multilateral and bilateral organizations in their adaptation and resilience building activities. It would provide guidance on adaptation actions and be the basis on which further concrete modalities would be developed.

Inviting discussions for further developing the FAA, in Bonn 2008, the EU described the possible basis of this partnership as follows:

Developed country responsibilities :

- Improving access to new additional and predictable financial flows.
- Supporting capacity building efforts in developing countries.
- Giving priority to the poorest and most vulnerable.
- Delivering on mitigation commitments to reduce the scale and costs of adaptation.
- Integrating adaptation into bilateral and multilateral development programmes.
- Supporting the availability of climate information, tools, methods and models.

Developing country responsibilities:

- Producing and implementing climate resilient plans and budgets.
- Prioritising adaptation measures.
- Creating enabling environments for adaptation responses (policy, legislative, institutional).
- Ensuring focus on the poorest and most vulnerable.

- Sharing experiences, knowledge and data to enable others to adapt.

In the next section the EU proposes potential elements of the FAA that would realise the partnership.

4. POSSIBLE ELEMENTS OF THE FRAMEWORK FOR ACTION ON ADAPTATION (FAA)

i) Development and integration of adaptation actions into national and sectoral planning processes.

The EU believes that for adaptation actions to be effective and sustainable, they should be an integral part of national development plans and be taken into account in budget planning and tailored to respond to the country specific circumstances and needs. Climate change risk should thus be factored into and responses integrated into all decision making at the local, national and where applicable, regional levels. Mainstreaming climate change poses a number of challenges to all countries and in particular developing countries. First, there needs to be an adequate information basis to make the right decisions and define necessary policies and associated responses. Secondly, climate change adds on to the challenge of development and has a cost associated to it.

In order to address these two fundamental issues, the EU proposes that a FAA would provide the basis to develop guiding principles and approaches to facilitate the integration of adaptation actions into national and sectoral planning processes, taking into account existing work in this area, for example by the OECD/DAC. In addition, the FAA would facilitate efforts to prepare vulnerability assessments and develop methods and tools to prioritise adaptation actions.

ii) Capacity building training and awareness to implement adaptation strategies.

Capacity building is central to and cuts across all aspects of adaptation. Enhancing the capacities of Parties, in particular LDCs, SIDs and African countries prone to drought, desertification and floods, is essential if they are to address the challenges posed by climate change and to design and implement effective responses. Furthermore, enhancing the capacities of relevant international and regional centres, networks and other organisations is critical to enable their engagement in adaptation action

The FAA would outline specific areas for capacity building on approaches and principles embodied in relevant COP decisions and call on Parties and relevant organisations, including the private sector, to take these into consideration in their activities. For example, under the Framework, the important role of regional centres undertaking work relevant to climate change would be acknowledged and underscored. Parties may want to make specific commitments to support such centres and networks to ensure that knowledge , technical and other necessary expertise is developed, used, shared and sustained at the regional and national levels.

iii) Risk management approaches.

Risk management approaches range from capacity building to ensure institutional preparedness (including to enhance the information base for risk assessment) to mitigation actions which in themselves are long term risk reduction measures (to reduce the risk of dangerous anthropogenic interference with the global atmosphere).

Through the FAA, the work of other relevant actors in the risk management area, such as the ISDR and International Federation of Red Cross and Red Crescent Societies (IFRC) would be acknowledged and drawn up in efforts to address adaptation at all levels. This would avoid duplication of efforts and improve synergies. Public-private partnerships, which harness the power of the market, are an attractive mechanism for supporting risk sharing. The FAA would serve to facilitate such partnerships, while calling on Parties to create and enhance enabling environments for adaptation actions.

iv) Mobilisation and cooperation with relevant organisations.

A variety of actors and processes are already engaged in actions that are relevant to adapting to climate change and will thus require coordinated efforts on many fronts. Governments have an important role to incentivise stakeholders in the public and private sector to engage in adaptation actions e.g. putting in

place the right enabling environment to reduce the operational risk to the private sector and other organisations engaging in adaptation.

A key element of the FAA, is to encourage the actions of other relevant organisations, private and public actors and strive for consistency and synergies between relevant processes.

v) Enhancing technologies for adaptation.

Technologies for adaptation range from those aimed at facilitating the process of adaptation (vulnerability assessments, early warning systems etc..) to those implementing adaptation (resilient crop types, improved techniques for water management etc.) Technologies for adaptation include basic tools and know-how already applied in day-to-day activities around the world, and more complex advanced techniques such as data observation systems. In enhancing technologies for adaptation, it is important to address actors in both the public and private sectors and recognise country specific needs and conditions.

The Framework for Action on Adaptation (FAA) would assist in identifying priority technology needs for adaptation. The framework for action on adaptation would also mobilise those organisations with relevant expertise (for example the Global Climate Observing Systems (GCOS) or the Consultative Group on International Agricultural Research (CGIAR)). Furthermore it would facilitate support for technology research and development, deployment, and diffusion, including from the private sector. The priority areas aimed at strengthening the adaptive capacities of the most vulnerable countries could include inter alia technologies to facilitate monitoring, forecasting and modelling climate change; those for improving the resilience of agriculture to the impacts of climate change and technologies for coastal zone management.

vi) Provision of adequate and predictable financial flows to assist developing countries that are particularly vulnerable.

Current estimates of the financial flows required for adaptation remain imprecise. However there is a consensus that they will need to be large: the UNFCCC estimates that the costs towards adaptation are likely to be at least tens of billions of dollars per year several decades from now. Further work by the UNFCCC and others should help to clarify the costs.

It will be essential to scale-up, mobilise and optimise finance and investments flows to deliver new, adequate, predictable and sustainable financial resources. Meeting the costs of adaptation to climate change including those related to strengthening the resilience of national and sectoral plans to climate change will require a variety of sources of funding. Public funding, in particular development cooperation resources will have a role to play, as will innovative funding sources including those from the private sector. National policies will play a key role in attracting private investments and optimising use of resources.

International support to manage the effects of climate change will be significantly more effective if it is in line with the international development assistance architecture. The principles of the Paris Declaration on Aid Effectiveness emphasise the importance of aligning actions with national priorities and of using common procedures to support national priorities.

The FAA would underscore the importance of simplified, transparent and straightforward procedures to ensure access by developing countries to adaptation support. It would also include guidance on effective means of delivery, for example to support programmatic approaches to adaptation and to ensure that support is channelled to the appropriate level to facilitate implementation.

Because there are few inherent market mechanisms that can drive private investment into adaptation projects in developing countries, public resources will play an important role in financing adaptation. For many countries the costs of adaptation will be borne domestically. But this will need to be supported by international finance, especially for the poorest and most vulnerable countries, where ODA will remain essential. Private investments can nevertheless be expected to cover a portion of the adaptation costs in several sectors, especially in sectors with privately owned physical assets.

The EU believes that there is a need for developing a broad toolbox which can leverage private and public financial flows. The following would seem to be among the main elements:

- **Existing mechanisms:** it will be important to continue with the existing mechanisms that channel finance and investment towards adaptation - such as the CDM levy.

- **National policies and private-public partnerships** will play a key role in attracting private investments and optimizing use of resources. Private–public partnerships can play a significant role in activating **private** investments for adaptation purposes, engaging the private sector in delivering public goods. There is a strong incentive for the private sector to contribute to partnerships when climate change is strongly connected to depreciation of economic resources and assets.

- **Generating finance while enhancing mitigation:** in Bonn, some Parties presented concrete proposals that could provide financing for adaptation, i.e. Norway, Mexico and Switzerland. Each has interesting aspects. For its part, the EU is already exploring innovative financing sources and implementing them. For instance in the EU 15% of the EU-ETS allowances for aviation will be auctioned from 2012 onwards and revenues should be used to tackle climate change including adapting to the impacts of climate change especially in developing countries[1].

The EU believes that it will be important to ensure effective provision of finance through a coherent, consistent and effective financial architecture which has strong synergies with national and international policies and efforts.

vii) Follow up on effectiveness of adaptation action.

An effective global effort to monitor progress on adaptation with the aim of incentivising and advancing adaptation at the local, national and regional level will be needed.
The FAA would provide guidance to enable evaluation of the effectiveness of adaptation actions in order to identify best practices, avoid maladaptation and highlighting policy and information gaps for further action. In this regard, the FAA would encourage Parties, relevant organisations and the private sector to provide the information necessary to facilitate the continued collective learning efforts on adaptation.

5. TAKING THIS WORK FORWARD IN ACCRA AND BEYOND

In Accra, the EU proposes that Parties focus on the priority areas that could be included under the FAA. The ongoing work to review the status of implementation of adaptation related decisions and the summary report of the first phase of the Nairobi Work programme will provide a good basis to identify key areas requiring strengthened commitments and modalities to support these.

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[1] *European Parliament legislative resolution of 8 July 2008 on the Council common position for adopting a directive of the European Parliament and of the Council amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community (5058/2008 – C6-0177/2008 –* 2006/0304(COD)*).*

PAPER NO. 2A: JAPAN

Global Long-term Goal

Submission on Global Long-term Goal

The Government of Japan submitted the document below as submission regarding the paragraph 1 of the Bali Action Plan in May 2008;

http://unfccc.int/files/meetings/ad_hoc_working_groups/lca/application/pdf/submissionjapan.pdf

In addition to this submission, Japan would like to issue 5 submissions which include updated information on the following issues.

(1) Global long-term goal
(2) Innovative technology development
(3) Commitments or actions by developed countries and actions by developing countries
(4) Sectoral approach
(5) REDD

In this submission, the Government of Japan outlines its view on global long-term goal for emission reductions.

1. According to the paragraph 1(a) of the Bali Action Plan, it is necessary to set the global long-term goal for emission reductions in order for all countries to share the recognition in addressing long-term challenges. In this context, the global long-term goal plays a central role in a shared vision for long-term cooperative action.

2. In order to achieve the ultimate objective of the UNFCCC to stabilize the level of GHG concentrations in the atmosphere, global GHG emissions and natural sinks should be balanced. For this goal, it is required that global GHG emissions peak in the next 10 to 20 years and be reduced at least by half in the long-term period.

3. Japan, as the chair of the G8 Hokkaido Toyako Summit held in July of this year, proposes that Parties adopt a vision of the goal of achieving at least 50% reduction of global emissions by 2050 in the UNFCCC negotiation.
   (1) At the G8 Hokkaido Toyako Summit in July of this year, G8 countries declared that they "seek to share with all Parties to the UNFCCC the vision of, and together with them to consider and adopt in the UNFCCC negotiation, the goal of achieving at least 50% reduction of global emissions by 2050."
   (2) In addition, at the Leaders Meeting of Major Economies on Energy Security and Climate Change which was held at the time of the G8 Summit, the leaders affirmed that they "believe that it would be desirable for the Parties to adopt in the negotiations under the Convention a long-term global goal for reducing global emissions, taking into account the principle of equity."

4. This long-term goal should be considered as a non-binding shared "vision" which will lead to ultimate solution to climate change.

5. In order to reduce global emissions at least by half, all countries are required under an enlightened sense of international solidarity to take mitigation measures based on the principle of "common but

differentiated responsibilities and respective capabilities", while developed countries should lead the global efforts of reducing emissions by achieving their significant reduction.

PAPER NO. 2B: JAPAN

Commitments or Actions by Developed Countries and Actions by Developing Countries

Submission on Commitments or Actions by Developed Countries and Actions by Developing Countries

The Government of Japan submitted the document below as submission regarding the paragraph 1 of the Bali Action Plan in May 2008;

http://unfccc.int/files/meetings/ad_hoc_working_groups/lca/application/pdf/submissionjapan.pdf

In addition to this submission, Japan would like to issue 5 submissions which include updated information on the following issues.

(6) Global long-term goal
(7) Innovative technology development
(8) Commitments or actions by developed countries and actions by developing countries
(9) Sectoral approach
(10) REDD

In this submission, the Government of Japan outlines its view on commitments or actions by developed countries and actions by developing countries.

1. The Bali Action Plan states in paragraphs 1 (b) (i) and (ii) that "all developed country Parties" should make/take "measurable, reportable and verifiable nationally appropriate mitigation commitments or actions, including quantified emission limitation and reduction objectives, ...while ensuring the comparability of efforts among them, taking into account differences in their national circumstances." It also states that "developing country Parties" should take "nationally appropriate mitigation actions ...in the context of sustainable development, supported and enabled by technology, financing and capacity-building, in a measurable, reportable and verifiable manner."

2. This indicates that the international community shares the recognition that climate change is now a global issue which can not be adequately addressed only with the efforts by Annex I Parties which currently commit to the quantified emissions limitation or reduction targets, while developed countries must continue to take policies and measures towards GHG emissions reduction. Also, there are growing differences among non-Annex I Parties in impact on climate change and capacity to respond.

3. An idea to respond to this situation is to categorize non-Annex I Parties into groups based on stages of economic development etc. and to encourage each Party to take suitable actions matched to its own group, in accordance with the principle of equity and the principle of "common but differentiated responsibilities and respective capabilities".

4. In the Declaration of the Leaders Meeting of Major Economies on Energy Security and Climate Change in July, the developed major economies shared the view that they would "implement, consistent with international obligations, economy-wide mid-term goals and take corresponding actions, ...reflecting comparable efforts among them." At the same time, the developing major economies agreed that they would "pursue ...nationally appropriate mitigation actions ...with a view to achieving a deviation from business as usual emissions."

5. A next step is to materialize those progresses of international discussions under the UNFCCC process. For this purpose, it is necessary to clarify the definition of “developed country Parties” and “developing country Parties” in the Bali Action Plan and to consider the concrete content of mitigation actions by developing country Parties as well as commitments or actions by all developed country Parties.

6. To address those issues, the AWG-LCA should start consideration of the following points;
(1) Developed country Parties in the paragraph 1 (b) (i) of the Bali Action Plan
Current Annex I Parties comprise OECD member states as of 1992 and countries in economic transition; however, some of non-Annex I Parties those already became OECD members and those on a par with Annex I Parties in their economic development stage should be required to make/take corresponding commitments or actions as developed country Parties in the paragraph 1 (b) (i) of the Bali Action and to become Annex I Parties during the course of the negotiation for the post-2012 framework.

(2) Developing country Parties in the paragraph 1 (b) (ii) of the Bali Action Plan
It is necessary to identify the countries including LDCs and SIDS which have little emissions and are not much required to take significant mitigation measures. Those countries should be given focused international supports including mainstreaming adaptation because of their vulnerability to adverse effects of climate change. Other non-Annex I Parties can also be categorized based on indicators such as economic development stage, capacity to respond for its nationally appropriate mitigation actions (e.g. GDP per capita) and emission share in the world. This will help to facilitate major developing countries for taking further mitigation actions and other developing countrieswith stipulating actions to be implemented by countries in each group, taking into account its circumstances, and also to provide corresponding measures and supports by developed countries.

7. In addition, it is necessary to consider a scheme that enables Parties to switch the groups from one to the other in response to their change of economic development stages etc.

PAPER NO. 2C: JAPAN

Innovative Technology Development

Submission on Innovative Technology Development

The Government of Japan submitted the document below as submission regarding the paragraph 1 of the Bali Action Plan in May 2008;
http://unfccc.int/files/meetings/ad_hoc_working_groups/lca/application/pdf/submissionjapan.pdf

In addition to this submission, Japan would like to issue 5 submissions which include updated information on the following issues.
(1) Global long-term goal
(2) Innovative technology development
(3) Commitments or actions by developed countries and actions by developing countries
(4) Sectoral approach
(5) REDD

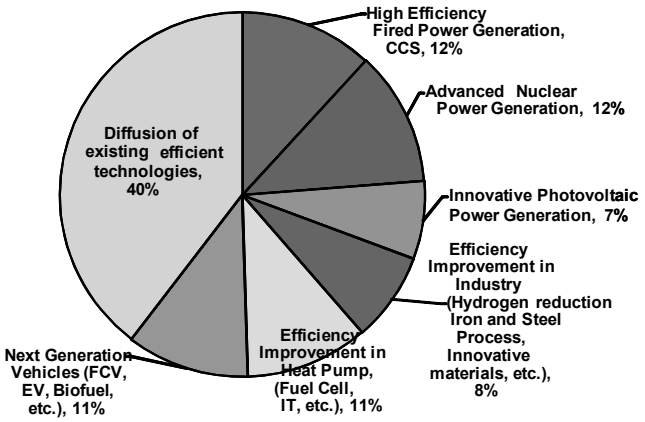
In this submission, the Government of Japan outlines its view on innovative technology development.

Technology plays an important role as a practical means of addressing climate change. The United Nations Framework Convention on Climate Change (UNFCCC) has discussed the role of technology in addressing climate change mainly from the viewpoint of technology transfer. However, merely the dissemination and transfer of existing technologies will prove insufficient to meet the long-term goal of reducing GHG emissions globally at least by half by 2050. To achieve this, innovative technology development will be indispensable.

While these efforts are to be undertaken primarily by developed countries as a part of "common but differentiated responsibilities and respective capabilities," it should be taken in account that appropriate cooperation with motivated developing countries should be incorporated into the view to promote the dissemination of these innovative technologies.

Considering the importance of innovative technologies and the urgency with which these technologies must be developed by around 2030 considering the time for dissemination, it is important to adequately grasp the significance of innovative technology development and its latest progress under the UNFCCC, and promote its acceleration where appropriate. Specifically, Parties should take advantage of the series of meetings including Conference of the Parties (COP) under the UNFCCC and accelerate the development of innovative technologies through expanding investment in technology RD&D, developing and sharing technology development roadmaps, strengthening existing frameworks for international cooperation and establishing new ones if necessary, with support of specialized agencies such as the International Energy Agency (IEA).

Contribution of technologies for the 50% Emission Reduction globally in 2050

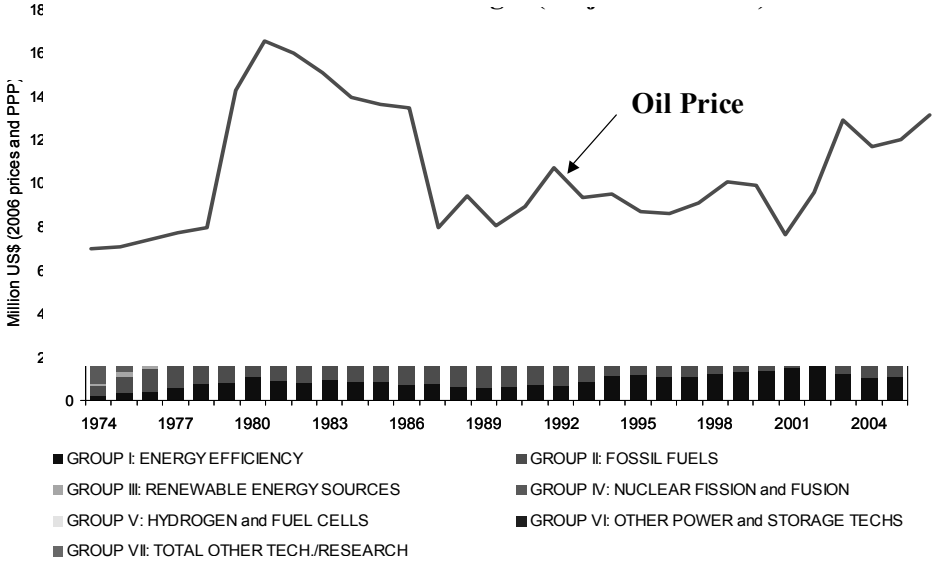


Source: METI, Japan "Cool Earth − Innovative Energy Technology Program" (March 2008)

1. Expansion of Investment in Innovative Technology Development

Investment in energy technology development around the world has been stagnated since reaching a peak in 1980. Due to long and massive investment required for innovative technology development, governments have a major role to play in R&D investment. Japan has already announced that it will be investing approximately US$30 billion over the next five years in research and development in the field of the environment and energy. Developed countries should make efforts to expand R&D investment in accordance with conditions in each country to fulfill their responsibilities as developed countries, based on the G8 Hokkaido Toyako Summit Leaders Declaration "in which G8 members have so far pledged over the next several years over US$10 billion annually in direct government-funded R&D."

Government R&D Budgets (IEA countries)



Source: IEA "Energy Policies of IEA countries 2006

2. Formulating and Sharing Technology Development Roadmaps

It is important to promote developing technology development roadmaps that can be shared globally, which make possible to analyze current status of technology development in each country and international cooperation, to share the direction of long-term technology development, and to promote systematic development of technologies. These efforts are expected to help nurture common

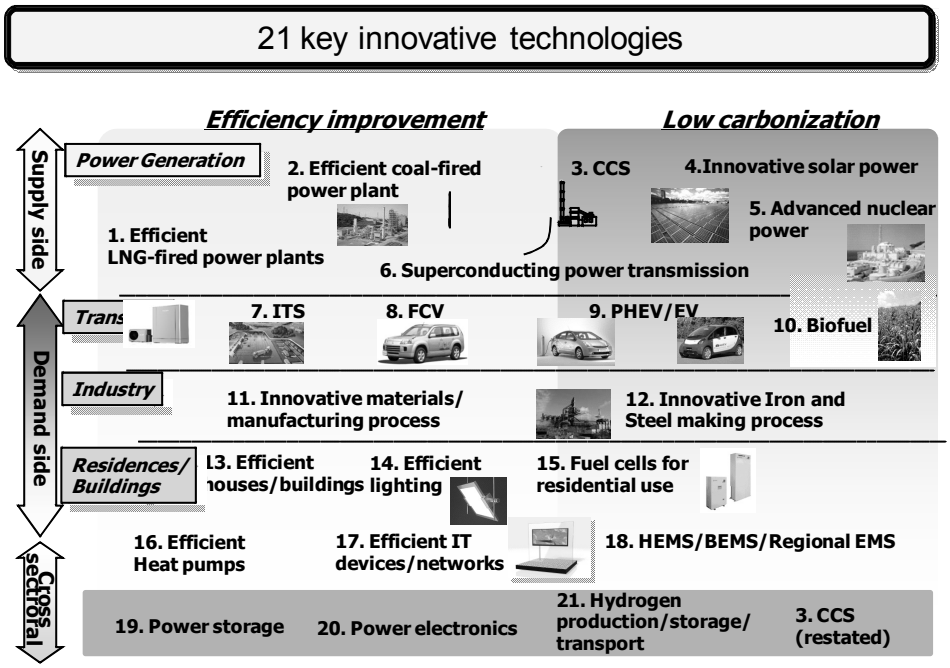
understanding on the timing in which those technologies are available, secure the R&D investment toward the accomplishment of the long-term goal, and steadily promote technology development through reviewing the progress. Such roadmaps would also provide an overview of various activities of technology development underway in each country, deepen international collaboration and identify areas on which focus should be placed.

Japan has formulated its own technology roadmaps for 21 key innovative technologies, as the "Cool Earth - Innovative Energy Technology Program[1]" (March 2008).

The IEA has also accumulated expertise on technology development in the energy field and it published the Energy Technology Perspectives 2008 (ETP2008) in June this year, which identified key technologies that contribute to significant GHG reductions by 2050 with their roadmaps. Several countries have also formulated their own technology roadmaps in their publications such as the "Climate Change Technology Program Strategic Plan" (September 2006) by the U.S. and the "European Strategic Energy Technology Plan" (November 2007) by the EC.

It is essential to formulate technology development roadmaps that can be shared globally by taking advantage of these countries as well as the IEA's expertise and occasions. This may be done by reviewing such existing roadmaps and sorting out the field of interest and direction of the technology development. Efforts should be made to develop a technology development roadmap that can be shared globally by the end of 2010.

As a contribution to the process, Japan will analyze the technology development roadmaps formulated by the IEA, the EC and the U.S. with a view to their technical details and deployment schedule, and examine them in comparison with Japan's Cool Earth- Innovative Energy Technology Program.

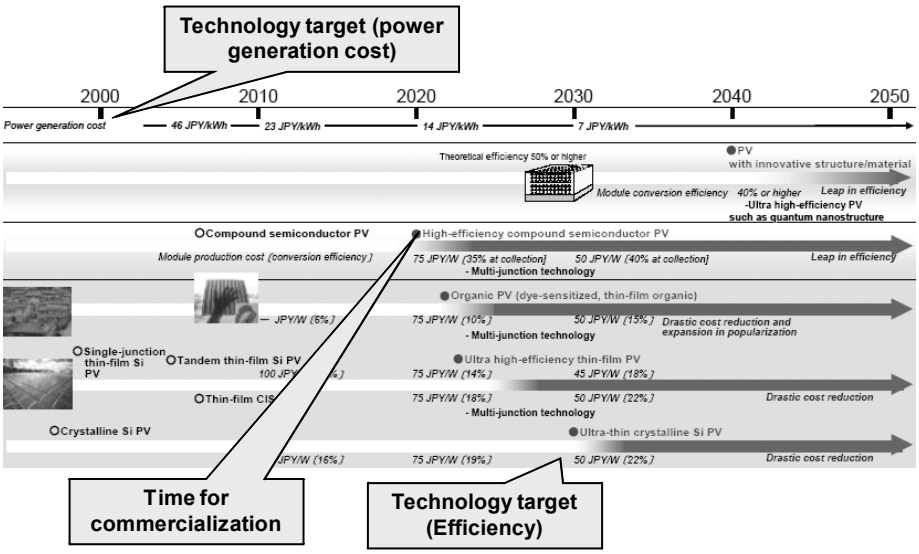


Source: METI, Japan "Cool Earth – Innovative Energy Technology Program"(March 2008)

[1] http://www.meti.go.jp/english/newtopics/data/pdf/031320CoolEarth.pdf
http://www.meti.go.jp/english/newtopics/data/pdf/CE_RoadMap.pdf

Example of technology roadmap toward 2050

21 key innovative technologies have been identified and roadmaps for each of them have been developed.
Roadmap for innovative photovoltaic power generation is shown here as an example.



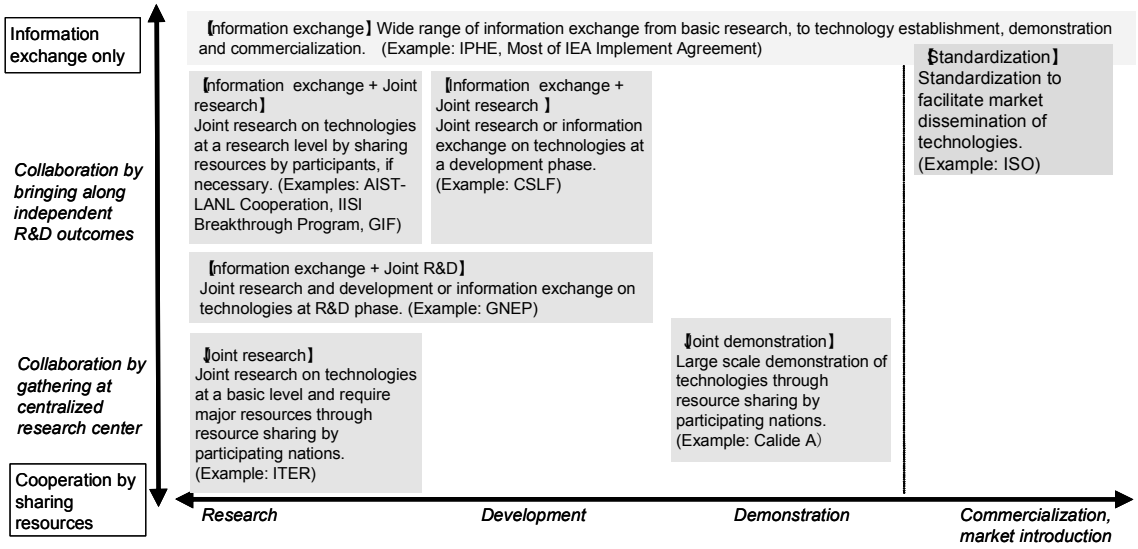
Source: METI, Japan "Cool Earth – Innovative Energy Technology Program"(March 2008)

3. Enhancement of Existing Frameworks for International Cooperation and Establishment of New ones

International cooperation of energy technology development has been advanced on various technologies such as nuclear power, zero-emission coal fired power generation and fuel cells. These include various forms of cooperation from information exchange to assigning the share of funding as well as the theme for each nation.

Partnership	Establishment	Objectives	Members / Partners
International Energy Agency (IEA), Implementing Agreements	Nov. 1974	To cooperate under the framework established in 1975, to support energy R&D in IEA member countries. Currently, 41 implement agreements have been signed upon and provide forums for information exchange on research, development, demonstration and deployment, cooperative research and development, etc. on various technology areas such as end-use technologies, renewable energy technologies and fossil fuel technologies, and cross-cutting area including climate change issues.	IEA's member countries including Japan, Europe and United States, etc. and non-member countries are participating according to their own interests.
Generation IV International Forum	Jan. 2000	To work together R&D for the fourth generation nuclear reactor. Six type of nuclear reactor systems that could be deployed about the year 2030, i.e. Sodium-Cooled Fast Reactor, Very-High Temperature Reactor, Gas-Cooled Fast Reactor, Supercritical-Water-Cooled Reactor, Lead-Cooled Fast Reactor and Molten Salt Reactor, will be developed under the international cooperation.	12 countries and 1 organization (Japan, United States, Canada, United Kingdom, France, Switzerland, Russia, Argentina, Brazil, South Africa, China, South Korea) and Euratom.
Carbon Sequestration Leadership Forum (CSLF)	Jun. 2003	To promote R&D of improved cost-effective technologies for the capture, transport and storage of carbon dioxide, and to facilitate international acceptance on CCS technology for its commercial use.	21 countries and 1 region(Japan, United States, Canada, United Kingdom, Germany, France, Italy, Netherlands, Kingdom of Norway, Denmark, Greece, Russia, Brazil, Mexico, Colombia, Australia, South Africa, China, India, South Korea, Saudi Arabia) and the European Commission.
International Partnership for the Hydrogen Economy (IPHE)	Nov. 2003	To accelerate research, development, demonstration and commercialization of hydrogen and fuel cell technologies. Also, IPHE provides a forum for advancing relevant policies, and common technical codes and standards.	16 countries and 1 region(Japan, United States, Canada, United Kingdom, Germany, France, Italy, Russia,Kingdom of Norway, Iceland, Australia, New Zealand, Brazil, India, China, South Korea) and European Commission.
Asia-Pacific Partnership on Clean Development and Climate (APP)	Jul. 2005	To work together to meet goals for growing energy demand, energy security, and climate change in Asia-Pacific region through regional cooperation which includes development, deployment and transfer of clean and efficient technologies. Specific joint project includes Callide-A to demonstrate a oxy-fuel pulverized coal fired generation with CO2 capture under Japan-Australia partnership.	7 countries (Japan, United States, Canada, Australia, South Korea, China, and India).
Global Nuclear Energy Partnership (GNEP)	Feb. 2006	To develop worldwide consensus on enabling the expanded use of nuclear power, while ensuring nuclear non-proliferation, safety and security. The goal includes the development of advanced fast reactors and technologies for recycling nuclear fuel, etc.	21 countries (Japan, United States, France, Italy, China, Russia, Australia, Republic of Bulgaria, Ghana, Hungary, Jordan, Kazakhstan, Lithuania, Poland, Romania, Slovenia, Ukraine, Canada, South Korea, Senegal, United Kingdom).

Source: METI, Japan "Cool Earth – Innovative Energy Technology Program"(March 2008)



Source: METI, Japan "Cool Earth – Innovative Energy Technology Program"(March 2008)

It is important to confirm the progress of innovative technology development through the globally-shared technology roadmaps and strengthen international cooperation in these areas. It should also be considered to set up a new framework for international cooperation in the areas that need additional impetus or lack international cooperation.

4. Points to Note in Promoting International Cooperation

In an effort to accelerate international cooperation without hampering the incentives of private enterprises, the entities ultimately responsible for technology development and dissemination, adequate considerations have to be made for several important points including the protection of intellectual property, the prevention of unintended leakage of technology, and an optimum balance between competition and cooperation.

International cooperation on nuclear energy should be promoted in the manner ensuring safeguards (nuclear non-proliferation), nuclear safety and security (3S).

Encouraging the participation of motivated developing countries from the research stage to promote proper dissemination of innovative technologies in such countries should also be incorporated into this perspective.

PAPER NO. 2D: JAPAN

Information, views and proposals on paragraph 1 of Bali Action Plan
(For AWG-LCA2)

0. Introduction

○ Japan welcomes the formulation of the Work Programme reached at the Bangkok AWG-LCA. Japan will proactively take part in the discussions for establishing an effective framework for beyond 2012 based on the Work Programme.

○ Taking the opportunity to present this submission, the Government of Japan would like to outline its view on the major issues for the Bonn meetings (SB28, AWG5, and AWG-LCA2).

1. Shared Vision

(1) Long-term Global Goal

○ For countries to share an understanding in addressing long-term issues, a long-term global goal needs to be set. The long-term goal should be considered as a non-binding shared vision.

○ In the long-term, global emissions and absorption of greenhouse gas (GHG) must be balanced. To this end, we aim to peak out global emissions in the next 10 to 20 years and eventually reduce them by half from the current level in the long-term.

○ The year 2050 should be a year for achieving long term goal for halving the emissions, allowing necessary time to develop and diffuse innovative technologies that can significantly reduce emissions and to change our social systems and infrastructures into a low-carbon society.

○ In order to halve global GHG emissions, all countries are required under an enlightened sense of solidarity to take effective mitigation measures in accordance with their respective capabilities, while developed countries must lead the global effort of reducing emissions by achieving a significant reduction.

2) Innovative Technology Development: Attachment 1

○ In order to achieve the long-term goal of halving global emissions by 2050, innovative technology development as well as the diffusion of existing technologies is indispensable.

○ On the other hand, global investments in technology development are currently stagnant. Also, there is no existing mechanism to systematically promote the technological development programmes of each country.

○ In order to promote investment in technology development in each country, it is important for public and private sectors to share an understanding for the future direction of technologies to be prioritized. Japan identified 21 major technologies that promise dramatic performance improvements and fundamental cost reductions, set development targets for each technology, and created a roadmap indicating future steps in chronological sequence. With International Energy Agency (IEA) playing a central role of the efforts, setting and sharing global technology development roadmap will contribute to the establishment of an international partnership for innovative technology development.

○ It is important to share the long-term global goal in order to promote continued efforts in innovative technology development which requires long-term work.

(3) Low-carbon Society: Attachment 2

○ In order to achieve the long-term goal of halving global emissions by 2050, it is necessary not only to develop innovative technology, but also to attain fundamental changes in society, including lifestyles, city planning, transportation, thus realizing a low-carbon society.
○ It is important for all countries to have a clear vision of a low carbon society.
○ Since national circumstances differ among countries, visions for realizing low-carbon societies must be developed through international partnership to meet country- and region-specific needs.
○ In order to share the vision of a low-carbon society, an international network of research institutions on low-carbon society should be utilized to promote research cooperation and information exchange.

(4)Sustainable Development/Adaptation

○ For attaining the ultimate solution to climate change, it is meaningful to recognize the significance of promoting sustainable development and enhanced adaptation in long-term as a part of the shared vision.

2. Mitigation

(1) Sectoral Approach: Attachment 3

○ Sectoral approach will contribute to the establishment of an effective international framework through providing scientific knowledge. In setting a quantified national reduction target, a country can apply sectoral approach to aggregate sectoral reduction volume on the bottom-up basis by examining sector-specific reduction potentials based on projections of activities by going through the review among countries. (Model analyses based on marginal mitigation costs will also contribute to providing images of how much more reduction potential a particular sector has in one country compared to other countries.)
○ At the same time, sectoral approach is also a useful method to accelerate transfer and diffusion of technologies through identifying the best practices and technologies and facilitating cooperative public and private activities which lead to global sectoral emissions reduction.
○ This approach 1) does not replace quantified national emission reduction targets, 2) is consistent with the principle of “common but differentiated responsibilities and respective capabilities”, and 3) does not apply a uniform standard across all countries.
○ On May 8, Japan hosted the International Workshop on Sectoral Reduction Potential with participation from governments, research institutions and industries. Participants shared an understanding for the effectiveness of sectoral approach and acknowledged that they would continue cooperative efforts to further elaborate the model and to improve data collection. Participants recognized that it is anticipated that there would be a gap between reduction potentials based on bottom-up approach and required emissions reductions levels calculated by top-down approach. It is necessary not only to account for wider range of mitigation potentials, but also to take into account additional mitigation strategies including policies, innovative technologies, and behavioral change (through e.g. national campaign). They also recognized the importance of securing environmental integrity (Attachment 4: Co-Chairs’ Summary).

○ Reduction potential analysis can scientifically identify technology-specific reduction potential and its costs, thus enabling the contribution of appropriate and practical measures.
○ In order to identify reduction potentials of each country and sector, it is indispensable to promote analysis regarding actions that should be cooperatively taken by each country, focusing on sub-sectors including the coal-fired power plant, steel, cement and road transportation sectors to begin with, as well as to accelerate data collection efforts implemented under the public-private partnerships including the IEA and APP.
○ The financial mechanism should be improved to support reduction efforts by developing countries through sectoral approaches.

(2) National Commitments or Actions
○ Current OECD member countries should commit themselves to actions as developed countries. Developing countries which are vulnerable to climate change should be identified in order to enhance their adaptation. The level of actions should be considered with regard to their economic development status, capacity to respond (e.g. GDP per capita), share of global emissions, emissions per capita and relative responsibility to climate change.
○ Commitments or actions by each country should be determined in accordance with their common but differentiated responsibilities and respective capabilities.

(3) Comparability of the Efforts among Developed Countries
○ Sectoral approach is effective to ensure comparability and equity.
○ A bottom-up approach to aggregate sector-specific reduction potentials will enable a country to set equitable targets while appropriately taking consideration of past efforts with realistic reduction measures based on current and future technologies to be introduced. More specifically, energy efficiency or emission intensity can serve as indicators in measuring the comparability.

(4) Measurability / Reportability / Verifiability
○ Introducing sectoral approaches which utilize data including the introduction rate of technologies, energy efficiency, and stock/vintage of existing equipments, establishing national inventories as well as improving national communications, are meaningful in implementing measurable, reportable and verifiable actions.
○ Major Economies, as a start, my initiate setting up appropriate national inventories, streamlining national communications and expert reviews, making use of the work of the IEA on energy indicators. In order for developing countries to establish national inventories, the development of primary statistics, mobilization of financial resource, and capacities-building should be actively promoted as well as implementation of expert reviews. Technological support, among other assistance, is required for these purposes.

(5) Co-benefits
○ In emerging countries demonstrating remarkable economic growth, it is an imminent task to address local pollution issues, including air pollution, in addition to GHG emissions. Therefore, the co-benefit approach, which aims at achieving GHG reductions and pollution control simultaniously, can serve as a strong incentive for developing countries and as an effective GHG reduction effort. Also,

building upon the wealth of know-how from conventional pollution control measures in Japan, the approach is also effective in terms of measurability, reportability and verifiability.

○ There are a considerable number of measures that can serve for both GHG emissions reductions and priorities of developing countries, namely, development. The co-benefit approach aims at implementing such measures and thus should constitute an important pillar of development strategies in developing countries.

○ It is important to identify the best practices for achieving the co-benefit approach, technology maps (list of available technologies), ways to identify concrete projects, and method to quantify the effectiveness and to transfer the knowledge to developing countries. Need for such an effort underscores the importance of enhanced framework for cooperation. Japan cooperated with the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) to establish such a framework, AP Gateway.

○ In order to mainstream the co-benefit approach into development, cross-sectoral cooperation among ministries responsible for other sectors is essential. For example, it would be important to cooperate with transport-related ministries to employ the environmentally sustainable transport (ETS) and with urban development ministries to share the recognition of compact city-design. Technological and financial support will be necessary for the formulation of projects and measures based on the co-benefit approach.

(6) Forests

○ It is important to learn best practices on practical measures to reduce emissions through sustainable forest management from the past and on-going projects as well as demonstration activities to be undertaken.

○ An appropriate distribution of benefits from emissions reduction among stakeholders, including local communities, is necessary in order to promote sustainable forest management and thus achieve sustainable reduction of emissions.

○ In order to introduce new policy approaches and create positive incentives, it is indispensable to improve institutional and capacity development in developing countries.

○ The view of Japan on methodological aspects of REDD is detailed in its recent submission (FCCC/SBSTA/2008/MISC.4, pp.35-37). The methodological workshop is planned to be held through 25-27 June 2008 in Tokyo, Japan. By considering the methodological issues in a constructive manner, this workshop should be a step toward creating the feasible options and shared images of policy approaches and positive incentives among Parties.

(7) Flexible Mechanisms

○ While the efforts of each country should be primarily based on domestic measures, a mechanism to acquire credits from additional emission reduction efforts is necessary to enhance technology transfer and to secure flexibility in achieving a target in each country, required.

○ However, in order to enhance efficient emission reduction, improvement of the current flexible mechanisms is indispensable.

○ In reviewing the current flexible mechanisms, it should be designed so that it could strengthen sustainable development in developing countries. In this regard, promotion of further positive actions

by developing countries and financial support for countries/regions which have not received substantial benefit under the current mechanisms should be discussed as a package.

○ With regard to the CDM, it is also necessary to deal with such issues including the non-eligibility of CCS and nuclear power, and the low probability in achieving approval for policy measures such as energy conservation projects.

○ Flexible mechanism such as the CDM should be implemented in a cost-effective manner.

○ It has been noted that although CDM was originally designed as a promising tool, it has not contributed to sustainable development to the extent that had been expected. Therefore, the current framework should be improved so that it could dedicate more to sustainable development. Co-benefits should be identified and considered in an improved CDM framework.

3. Adaptation

○ Adaptation is related to a wide range of issues and thus it is important for developing countries to mainstream it into development policy. The OECD/DAC is compiling knowledge on mainstreaming adaptation, and a consensus is essential for the appropriate mainstreaming.

○ Adaptation to climate change is an issue to be dealt with by all countries; however, development of adaptation measures is most imminent in regions with demonstrated need. Adaptation measures must be developed in such countries that are vulnerable to adverse impacts from climate change (SIDS and LDCs, etc.).

○ In implementing adaptation measures, scientific knowledge is essential to prevent mal-adaptation. Japan's Earth Simulator, which predicts future climate, plays an important role in obtaining basic understanding for the implementation of adaptation measures. Japan will invite trainees from six countries this fiscal year to provide training on the Earth Simulator.

○ The development of methods and indicators to assess the usefulness and the effectiveness is necessary. In Japan, the IGES is engaged in developing such indicators with the World Bank.

○ Efficiency of risk diversification mechanisms, including insurance, must be considered. Efforts such as the one done by the JBIC research group need to be advanced.

○ It is crucial to increase financial support for adaptation measures. Japan has launched an initiative to enhance the financial support for adaptation measures, and the possibility of adaptation programmes is being discussed within the multilateral funds now under consideration to be established in the World Bank.

4. Technology

(1) Technology Diffusion / Transfer: Attachment 5

○ International sector-specific technological cooperation activities, including public-private efforts such as the Asia-Pacific Partnership (APP) have been developed.

○ Making use of the efforts of these activities, a structure for specific technological cooperation and technology transfer in accordance with country-specific needs should be widely introduced, based on the efforts by identifying necessary best practices (including technology and policy measures) in each sector, assessing technology installation status in developing countries, and analyzing reduction potential.

○ The IEA work to collect best practices and to develop energy indicators has great significance in adopting this approach.

○ Such a cooperative sectoral approach will realize effective reductions in developing countries through technological cooperation and will contribute to the development of measurable, reportable and verifiable actions by developing countries.
○ Furthermore, global sectoral emission reductions can be realized by each sector through implementing the best practices, while preventing carbon leakage.

(2) Technology Development: Attachment 1
○ In order to achieve the long-term goal of halving global emissions by 2050, innovative technology development as well as the diffusion of existing technologies is indispensable.
○ On the other hand, global investments in technology development are currently stagnant. Also, there is no existing mechanism to systematically promote the technological development programmes of each country.
○ In order to promote investment in technology development in each country, it is important for public and private sectors to share an understanding for the future direction of technologies to be prioritized. Japan identified 21 major technologies that promise dramatic performance improvements and fundamental cost reductions, set development targets for each technology and created a roadmap indicating future steps in chronological sequence. With IEA playing a central role of the efforts, setting and sharing global technology development roadmap will contribute to the establishment of an international partnership for innovative technology development.
○ It is important to share the long-term global goal in order to promote continued efforts in innovative technology development which requires long-term work.

5. Finance
(1) Financial Assistance
○ Japan has established a new financial initiative on the scale of US$ 10 billion to proactively support developing countries' efforts to reduce emissions, such as efforts to enhance energy efficiency, and to promote "Cool Earth Partnership" with developing countries suffering severe adverse impacts as a result of climate change.
  ● Specifically, policy consultations will be held with developing countries to secure a basic consensus on ideas regarding climate change issues, after which climate change-related programme support (policy development support, programme development and capacity building support) and project support to promote climate change measures in developing countries should be implemented.
  ● Such support is aimed to promote negotiations for the establishment of an effective framework beyond 2012 in which all countries participate.
○ Japan is promoting the "Cool Earth Partnership" with seven countries since January. For example, with Indonesia, Japan and Indonesia are aiming to conclude the consultation concerning a climate change programme loan by the G8 Summit in July. Also, Japan decided to provide a non-project grant-aid for Senegal, Madagascar and Guyana. Japan continuously seeks to further promote the "Cool Earth Partnership" through policy consultation with developing countries which seek to realize both emission reduction and economic growth.

○ Japan is working for the establishment of multilateral funds for addressing climate change, in cooperation with multilateral development banks international organizations and other interested countries.

(2) Structure for Cooperation

○ Support for adaptation (finance, technology transfer and capacity building) should be intensively extended to countries vulnerable to the adverse effects of climate change (SIDs, LDCs, etc.).
○ Developing countries, including African countries, which cannot enjoy modern energy services, should be given assistance in achieving economic growth utilizing clean energy.
○ Support for mitigation should be focused on the countries which are trying to achieve effective emission reduction under ambitious goal, including significant energy efficiency improvements in major sectors. Furthermore, when necessary, support should be provided towards capacity building for the implementation of measurable, reportable and verifiable actions.
○ Support for developing countries should be implemented in an appropriate manner, including not only the employment of public funds but also the maximum use of private funds.
○ Regarding GEF-5, more effective fund allocation paying attention to mid-small developing countries, and the utilization of private funds should be emphasized, based on RAF interim review and OPS-4 report, bearing in mind the efficiency and effectiveness of the fund.
○ The SBI is currently developing performance indicators for the development and transfer of technologies. Building upon the research, and through developing adaptation-related vulnerability indicators, it is important to examine measures to enable technology transfer and financial assistance in a measurable, reportable and verifiable manner.

6. Legal Considerations

○ In order to crystallize the decided elements in Bali Action Plan into legal documents, considerations should be made on the legal issues regarding, inter alia, the following points: 1) shared vision; 2) ensuring the comparability of mitigation commitments or actions among developed countries; 3) measurable, reportable and verifiable mitigation actions by developing countries; and 4) sectoral approaches
○ Specific issues to be considered include:
  - Consideration on incorporating long-term perspectives (shared vision, innovative technology development, low-carbon society, sustainable development / adaptation).
  - Legal consideration on the methodology to ensure comparability of efforts among developed countries in setting their commitments.
  - Review of the base year from the viewpoint of data reliability. Update of the base year to a more recent year, for instance, may be effective.
  - Joint fulfillment of commitments (bubble), provided in Article 4 of the Protocol, should be reviewed from the perspective of equity and effectiveness, as the responsibility of each country will be less clear.
  - Measurable, reportable and verifiable actions by developing countries should be stipulated. The mechanism to consider the level of actions with regard to their economic development status, capacity to respond (e.g. GDP per capita), share of global emissions, emissions per capita and relative contribution to the climate change should be considered.

- ● Flexible mechanisms should be reviewed. (e.g. improvement toward sustainable development of developing countries while promoting their own actions; consider co-benefits)
- ● Comprehensive legal considerations should be made for the abovementioned issues.

○ The suggestions given above are closely related with not only discussions in the AWG-LCA but also with the AWG-KP and the Article 9 Review under the Kyoto Protocol. A draft of the legal document must be prepared by mid-2009. These issues require integrated discussion.

○ Therefore, we propose that a cross-sectoral expert group on legal issues be launched under the AWG-LCA later this year in order to consider these issues in a cross-cutting way and hold a roundtable on legal issues at AWGLCA4 (COP14).

7. Status of Discussion in Other Processes and Their Useful Input

○ Constructive discussions on long-term goals, mid-term targets, adaptation, finance and technology are underway in the G8 process and at Major Economies Meetings, etc. The UNFCCC process should refer to the outcomes of these discussions as a useful input.

○ The G8 Business Summit and industrial initiatives, including those led by WBCSD, IISI, IAI, etc. should also be considered as valuable inputs. (Attachment 6)

(Attachment 1)

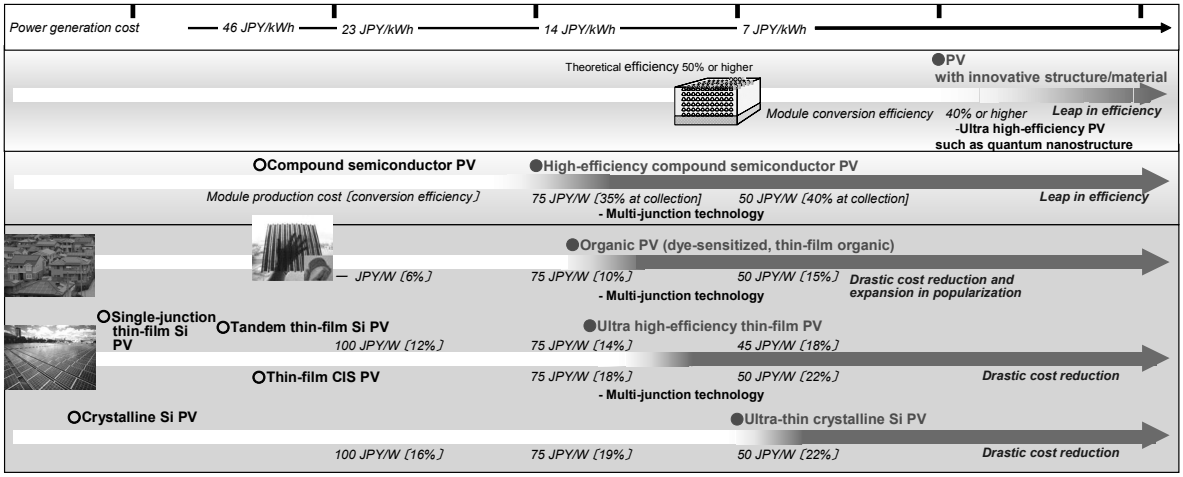
Innovative Technology Development

(1) Promotion of IEA-based International Cooperation

○ The IEA shall lead a study with other relevant institutions or partnerships on technologies that should be given priority in their development and diffusion under cooperation with private companies and research institutions, and develop a "Technology Roadmap for Innovative Energy Technologies Development Roadmap" indicating the direction of future developments and technical challenges to be shared across the world.

○ Countries shall proactively commit to increased investments in technology development and make consistent investments according to a roadmap shared under public-private partnership; and at the same time newly establish and strengthen international partnerships in areas where efforts are insufficient, therefore seeking accelerated technology development at a global level. The achievement level should be also monitored.

○ New international cooperation shall be actively pursued, including the reinforcement of existing



international framework such as GNEP CSLF, and fundamental agreement between Japan-China and Japan-Australia for collaborative demonstration project on zero-emission coal fired power plants.

(Example of Technology Roadmap for Innovative Energy Technology)

(2) Innovative Technology Development in the discussion under the UNFCCC

○ Innovative technology development must be treated as important pillar in discussions under the UNFCCC. It should be noted that sharing technology roadmaps that show technology RD&D needed for short, mid, and long-term to achieve the shared long-term goal will advance continued efforts in technology development.

○ For example, an effective undertaking would be to incorporate the "Technology Roadmap for Innovative Energy Technologies" as an element of the future framework and to receive reports on the progress made with the support of the IEA.

○ Also, the relationship between long-term goal and innovative technology development (e.g. future reduction potential) need to be discussed with the cooperation of the IEA.

(Attachment 2)

Low-Carbon Society

(1) Basic Concept

In order to achieve the long-term goal of halving global emissions by 2050, not only innovative technology development but also fundamental changes in society, including lifestyles, cities and transport, leading to the realization of low-carbon society are essential.

(2) Principles of a Low-Carbon Society

- ○ Carbon minimization
- ○ Simpler lifestyles that realize a richer quality of life
- ○ Coexistence with nature

(3) Image of a Low-Carbon Society

① Cities

Building compact cities that are comfortable and lively

② Mobility

Public transportation systems playing a major role; intelligent transport systems and high-efficiency automobiles

③ Living and Working Environment

Diffusion of high-insulation housing and buildings, high-efficiency appliances and energy-efficient IT devices

④ Energy Supply

Low-carbon energy supply achieved by innovative technology

⑤ Industry (Manufacturing, Construction, Service)

Low-carbon manufacturing technologies and goods and services, promotion of green jobs

⑥ Forests / Agricultural Land / Oceans

Contribution as carbon sink and renewable energy supply source

⑦ Consumer Choice

Generalization of carbon-minimized options as a result of enhanced “visualization” changed consumer consciousness

⑧ Finance / Investment / Information Disclosure

Provision of funds for low-carbon businesses and technologies

(4) Achievements Expected of G8 Summit

○ Initiation of policy dialogue towards sharing visions of a low-carbon society and international collaboration among research institutions to support such dialogue and to promote the development of a low-carbon society.

(Attachment 3)

Sectoral Approaches

(1) Basic Concept

○ Sectoral approaches is a method to examine sector-specific reduction potentials of each country to calculate sector-specific reduction volume based on this reduction potential and prospects of productive activity which are examined through the review among countries and to set a quantified national GHG emissions reduction targets by aggregating sectoral reduction volumes in the bottom up approach. (Model analyses based on marginal mitigation costs will also contribute to providing images of how much more reduction potential a particular sector has in one country compared to other countiries.) At the same time, sectoral approach is also a useful method to accelerate global emissions reductions through identifying the best practices and technologies in each sector and promote the transfer of such technologies and experiences.

(2) Principles for further consideration

○ No replace a quantified national emission reduction target
○ Consistent with the principle of "common but differentiated responsibilities and respective capabilities"
○ Not apply a uniform standard across all countries

(3) Method for Discussion

○ From the perspective of effectiveness, energy-related CO2 emissions should first be considered.
○ The source of energy-related CO2 emissions can be categorized into four key sectors: power generation, industry, commercial/residential and transport. In each key sector, key sub-sectors with large emissions and substantial reduction effects will be focused for intensive discussion; discussions will include what actions countries should take cooperatively in common.
○ In detail, four key sub-sectors, namely, coal-fired power plant, steel, cement and road transportation (which together account for 52% of the world's energy-related CO2 emissions), shall be prioritized in discussions; once methodologies etc. have been compiled, discussions will be expanded to other sectors.
○ Analysis of the estimation model focusing on costs required for measures, through a bottom-up approach to aggregate sectoral reduction potential based on marginal reduction costs can scientifically identify technology-specific reduction potential and costs, therefore making it possible to discuss an appropriate practical structure (including quantified national emissions reduction targets). On the other hand, attention should be paid to the factors such as political or social cost which can not be reflected in the model.
○ Model analyses should be promoted under international cooperation by enabling the comparison of different models and clarifying ideas through identifying various preconditions. Findings as a scientific knowledge on mitigation potential should be utilized in negotiations.
○ Explore the consistency with other existing policies and measures, including emissions trading scheme.

(4) Points to be considered

①**Continued and enhanced data collection**

- Work in close collaboration with the IEA to encourage IEA member countries and others to submit data in a common format.
- Develop a mechanism to accelerate knowledge sharing among countries (for example, utilize international partnership for energy conservation).
- Enhance inventory data.

②**Support for sector-specific emission control in developing countries**

- Consider possible financial mechanisms for developed countries to provide technological and financial support to developing countries that set sector-specific energy efficiency targets and action plans making efforts to achieve them.
- Design the Clean Technology Fund currently under discussion in the World Bank to support sectoral energy conservation efforts, introduction of clean energy and data collection to predict and calculate their effects.
- Establish mechanisms to accelerate sector-specific energy conservation efforts through an international partnership for energy conservation.

③ **Comparability of Efforts among Developed Countries**

- Employ sectoral approach in the way to ensure comparability and equitability among developed countiries' efforts.
- Apply a bottom-up approach to aggregate sector-specific reduction potentials which enables to set feasible targets while appropriately taking past efforts into consideration with realistic reduction measures based on technologies to be introduced. More specifically, energy efficiency or emission intensity can serve as indicators in measuring the comparability.

④ **International Enhancement of Technology Development in Key Sectors**

- In order to enhance international collaboration on technology development in key sectors in collaboration with the IEA, establish and share technology development roadmaps which promote international cooperation in a specific sector making use of existing mechanism such as CSLF, GNEP, IPHE.

(5) Future Direction of Discussions

○ Outcomes of the IEA Workshop (May 14-15), the International Workshop hosted by Japan (May 8), the G8 Summit process, the Major Economies Meetings (including the workshop held on April 17) etc. should be considered as useful inputs in future discussions. Also, discussions in AWG-LCA and AWG-KP are closely linked, and thus discussions on the sectoral approach in both processes should be developed in a unified manner.

○ When developing the 2009 AWG-LCA work programme, discussions on data collection, support for developing countries and technology development should be continued as key matters.

(Attachment 4)

International Workshop on Sectoral Emission Reduction Potential Co-Chair's Summary

1. Overview

International Workshop on Sectoral Emission Reduction Potential was held on 8th May in Paris, hosted and organized by the Government of Japan. It was attended by approximately 80 experts of policymakers, researchers, and industrial sectors representatives from 17 countries, the European Commission, and 3 international organizations.

2. Objectives

In order to establish an effective framework for a post-2012 period, it is essential for the international community to enhance understanding in the potentials of GHG emissions reduction potentials across various sectors and regions. Bottom-up approach can evaluate sectoral and regional mitigation potentials in a scientific and transparent manner. Such an approach can serve as one of the useful tools to contribute to setting an equitable quantified national target in the emissions reduction as emphasized by the Japanese Prime Minister Yasuo Fukuda in his special address in Davos January, 2008.

Various research institutions have been conducting studies on sectoral emissions reduction potentials. In addition, cooperative sectoral activities through several international partnerships, such as Asia-Pacific Partnership on Clean Development and Climate (APP) and those undertaken by various international industry associations (IISI, CSI, etc.) have been promoted in order to identify and realize GHG emissions reduction potentials.

As part of Japan's initiative under the G8 Summit process, the Government of Japan held this international workshop to share among researchers, industry sectors representatives, and policymakers the latest information on analysis of mitigation potentials in each sector and the common understanding in the so-called sectoral approaches.

The outcomes from the workshop will be reported to the G8 Environmental Ministers Meeting held in Kobe, Japan from 24th to 26th May, 2008.

3. Participants

<Co-chairs>

Dr. Ryutaro Yatsu (Ministry of the Environment, Japan) and Dr. Kazuhiko Hombu (Ministry of Economy, Trade and Industry, Japan)

<Researchers and International Organizations>

Cambridge University, CentroClima (Brazil), Ecofys, Indian Institute of Management, International Conference on Electricity Distribution (CIRED), IEA, International Institute for Applied Systems Analysis(IIASA), Institute for Global Environmental Strategies (IGES), Lawrence Berkeley National Laboratory (LBNL, USA), McKinsey & Company, Netherlands Environmental Assessment Agency (MNP), National Institute for Environmental Studies (NIES, Japan), OECD, Pacific Northwest National Laboratory (PNNL, USA), Research Institute of Innovative Technology for the Earth (RITE, Japan),

Tohoku University, Tokyo Institute of Technology, UK Energy Research Centre, and UNFCCC (Many of the participants are also IPCC authors.)

<Policy makers>
Australia, Canada, Czech Republic, European Commission, France, Germany, Italy, Japan, Latvia, Mexico, Norway, New Zealand, Slovenia, United Kingdom, and United States of America.

<Industries>
ArcelorMittal, International Aluminium Institute (IAI), International Iron and Steel Institute (IISI), Nippon Steel Corporation, Taiheiyo Cement, Tokyo Electric Power Corporation, World Business Council for Sustainable Development (WBCSD)

4. Key Findings

Session1: A Role of Bottom-up Studies on Sectoral GHG Emissions Reduction Potentials

In the Session 1, NIES, RITE, LBNL, MNP, and McKinsey & Company reported from their recent research outcomes through bottom-up studies on sectoral GHG emissions reduction potentials. The executive summary of these studies is found in the Appendix 1.

Following presentations, discussion between the scientists and policymakers was held and the key findings are identified as follows;

- The negotiations on the emissions reduction targets at the COP3 in 1997 could have involved more scientific knowledge on mitigation potentials. The bottom-up studies could provide useful information on a range of technical mitigation estimates that could be used as a basis for discussions to achieve effective future framework and fair national emission reductions target.
- In general, potential for mitigation is relatively small in countries where energy-efficient technologies have been widely introduced, whereas there are greater potentials in countries where the technologies have not fully been introduced. This is the case especially in most of the developing countries. It is essential, therefore, to provide the developing countries with support in terms of technology, finance, and capacity building in order to realize their emissions reduction potentials.
- Although sector types with large mitigation potentials vary depending on the socio-economic circumstances in each country, according to recent analysis, relatively large reduction potentials at low mitigation costs are found in power generation, industry and transport sectors. It is important to consider mitigation costs in addition to technical mitigation potentials. There are several net negative cost opportunities and cost-effective mitigation opportunities. The realization of these opportunities should be accompanied by providing appropriate incentives. Co-benefits from mitigation actions can offset a large fraction of mitigation costs, and therefore, they should be taken into account in promoting mitigation measures.
- It is anticipated that there would be a gap between reduction potentials based on bottom-up approach and required emissions reductions levels calculated by top-down approach. It is necessary not only to account for wider range of mitigation potentials, but also to take into account additional mitigation strategies including policies, innovative technologies, and behavioral change (through e.g. national campaign).
- Enhanced international collaboration among researchers and research institutions can be effective in furthering meta-analyses of modeling assumptions. Such analyses can identify mitigation potentials

and provide policymakers with reliable scientific information. A unique opportunity for dialogue between policymakers and scientists has been proved effective and, therefore, shall be continued in the future.

Session2: A Role of Cooperative Sectoral Activities for Identifying and Realizing Emission Reduction Potential

In the Session 2, representatives from several governments provided their perspectives on the sectoral approach, and several industry sectors introduced their activities on the analysis of mitigation potentials and ongoing international mitigation actions, including those under the Asia-Pacific Partnership (APP).

As future tasks for realizing the mitigation potentials that were calculated through research, the following points were suggested:

- In order to implement specific mitigation actions, it is necessary to include political and social factors, which are not reflected in the modeling analysis.
- Targets and commitments of each country, which will be determined through international negotiations, should take into account differences in national circumstances, and sector-specific characteristics, under the principle of "common but differentiated responsibility and respective capabilities." Sectoral approach does not substitute national reduction target and does not intend to apply a uniform standard to the developed and the developing countries.

In general, following points are confirmed,

- Discussing how to promote mitigation actions and cooperation and tranforming these ideas into actions through public-private partnership in each sector will be effective for achieving global GHG emissions reduction.
- Appropriate introduction of the sectoral approach will ensure measurable, reportable, verifiable mitigation actions.
- It is important to consider the differences in national circumstances of each country and characteristics of each sector.
- For seamless implementation of sectoral approach, further efforts in enhancement of data collection are crucial.

Session3: Issue for Future Works

- The latest findings from bottom-up mitigation potential studies were collected and reviewed as one of the scientific bases for future negotiations.
- It is crucial to promote wider coverage of data collection, especially in developing countries, as well as identification of mitigation measures, timing of technology adoption its diffusion rate, and other relevant information and data in order to enhance robustness of modeling results on mitigation potentials.
- To contribute to post-2012 framework negotiations, the participants shared a view that it would be necessary to continue to work on comparison among bottom-up models by focusing on identifying modeling assumptions in such field of fuel price, GDP growth rate, and discount rate in order to enable policymakers to understand the diverse outcomes from various models.
- It is urgent to investigate how cooperative sectoral activities can be integrated into a post-2012 framework.

(Attachment 5)

Technology Transfer / Diffusion

(1) Progress under the APP

○ APP is a public-private partnership encompassing seven member countries, namely, Australia, Canada, China, India, Japan, Korea and US. The total CO2 emission volume of these countries account for almost half of global emissions and the sectors covered by the partnership represent almost 60% of the energy consumption and CO2 emission in the seven countries.

○ The experts gather under the eight sectors to identify efficient technologies and to discuss the issues and countermeasures regarding diffusion and transfer of technologies. In details, the experts make energy efficiency indicator by sector as benchmarks (through comparison and analysis of best practices), clarify the reduction potential of the entire sector and identify the technologies for efficiency improvement to be transferred.

<Support based on APP scheme>

(See Attachment 5-2)

(2) IEA's work

○ The IEA was tasked by the G8 Gleneagles Summit to develop energy indicators and collect best practices, the progress of which is to be reported at the Hokkaido Toyako Summit in July.

○ Energy indicator will be set and reported for sectors such as power generation, steel, cement, chemistry and paper/pulps. These sectors will cover 50 % of energy-related CO2 emissions. It is important to continue works on enhanced data collection, expansion of countries and sectors covered and integration of calculation methods, etc.

(3) Technology Transfer and Diffusion under UNFCCC

○ The abovementioned efforts should be institutionalized in the future framework in order to enhance the technology transfer and diffusion.

(Attachment 6)

Efforts by the Private Sectors

(1) G8 Business Summit

○ In order to send the industrial sector's message to the G8 Summit, Business Summit was launched by the initiatives of the Federation of German Industries etc. on the occasion of the Heilingendam Summit in 2007.

○ In 2008, the Nippon Keidanren hosted the G8 Business Summit, where a Joint Statement was agreed as a message towards the Hokkaido Toyako Summit. The following are included as for climate change;

(a) Requests to the Hokkaido Toyako Summit

- Exploring equitable and comparable emissions reductions that are based on sound science, national circumstances, transparent, measurable and verifiable methodologies, sectoral and economy wide considerations and impacts and cost effective opportunities for energy efficient improvement
- Encouraging further development of cooperation-based sectoral approach like the Asia Pacific Partnership (APP), including data gathering
- Stimulating development and dissemination of innovative low carbon technologies

(b)Actions by the Industry

- Voluntary cooperating with works on sectoral approaches and helping to increase the understanding of the benefits and roles of them
- Discussion exchanging views on principles that may help business develop its work in this field

(2) International Collaboration within Each Sector

○ Various international partnerships and initiatives have been implemented in each sector.

(a) IISI (International Iron ad Steel Institute)

Consisted of approximately 170 major steel manufacturers of the world. In addition to making proposals regarding climate change, it has collected data, established an policy study group and has engaged in research development towards the global application of sectoral approach.

(b) WBCSD CSI

Composed of 19 cement companies of the world, it is engaged in the collection of best practices to address climate change, the development of guidelines, and the enhancement of databases including CO2 emissions.

(c) IAI (International Aluminum Institute)

Covering 80% of the world's aluminum, it has succeeded in reducing GHG emissions in the aluminum industry through integrating calculation methods, establishing a common reduction target, developing benchmarks and reporting and monitoring. (GHG emission reductions by 14% against a 20% production increase from 2000 to 2005.)

PAPER NO. 3: MEXICO

Enhanced action on the provision of financial resources and investment to support action on mitigation and adaptation and technology cooperation

SUBMISSION BY MEXICO

13 August 2008

Subject: **Enabling the full, effective and sustained implementation of the Convention through long-term cooperative action now, up to and beyond 2012**

(e) Enhanced action on the provision of financial resources and investment to support action on mitigation and adaptation and technology cooperation

Mexico welcomes the opportunity to submit, as requested by the AWG-LCA (FCCC/AWGLCA/2008/8), specific proposals on *enhanced action on the provision of financial resources and investment to support action on mitigation and adaptation and technology cooperation*, as contained in paragraph 1 of the Bali Action Plan.

Introduction

The current financial system in place for tackling climate change includes a large number of specific funds, generally with limited scope and an inadequate structure of governance, together with the Kyoto Protocol flexible mechanisms. In particular, the Clean Development Mechanism (CDM) is the only instrument allowing the participation of developing countries, through compensating for excess emissions in developed countries. The CDM does not expand the global scale of mitigation. Moreover, the CDM faces other difficulties and limitations, including the fact that it has not been accepted by all developed economies. The current financial system thus turns out to be insufficient to support the action required in developing countries.

The document *Investment and Financial Flows to Address Climate Change*, developed by the Convention's Secretariat, is invaluable for orienting this process. It indicates that, including public and private sources, global additional investment and financial flows required in 2030 to return global greenhouse gas emissions to current levels would amount USD 200 - 210 billion, 46% of which would correspond to non-Annex I countries (92 - 96 billion dollars). This estimate does not take into account adaptation requirements.

For the energy sector alone, some estimates by the International Energy Agency and the World Bank calculate that additional annual investment requirements needed by developing countries to ensure a low carbon energy future may amount to US$30 billion dollars.

Some of the additional investment needed for mitigation could be met with existing mechanisms (carbon finance, GEF, Official Development Assistance, etc.). The future scope of these mechanisms is uncertain, and depends on the evolution of commitments made by developed countries. However, even using the most optimistic estimates, the mechanisms that exist today would not be able to reach the necessary level of investment.

In consequence, we face the challenge of designing a financial mechanism able to broaden the scale of mitigation and adaptation activities. Such an instrument must be financially feasible, equitable,

predictable, efficient and inclusive, while encouraging the full participation of countries, both developed and developing, based on their own circumstances and needs.

A World Climate Change Fund

Proposal
Mexico proposes that as part of an agreed outcome resulting from the Bali Action Plan, a World Climate Change Fund (Green Fund) be multilaterally agreed upon and established as a financial scheme that complements existing mechanisms and ensures the full, sustained and effective implementation of the United Nations Framework Convention on Climate Change (UNFCCC).

Objectives
The Fund would have as specific objectives the following:

- To scale-up funds for mitigation actions,
- To support efforts to adapt to the adverse effects of climate change and the impacts of response measures,
- To provide technical assistance and promote the transfer and diffusion of clean technologies,
- To contribute to the financial underpinning of the new global climate change arrangement based on the Convention.

Contributions
It is expected that all countries contribute to the *Fund* in strict accordance with the principle of *common but differentiated responsibilities and respective capabilities*. Differentiation of responsibilities and capabilities could be determined through the adequate use of three simple indicators:

- **Greenhouse gas emissions.**
- **Population.**
- **Gross Domestic Product (GDP).**

Methods for ascertaining possible contributions could be developed based on several models that combine these simple indicators. Contributions will be determined using an objective formula, periodically subject to review, and based on criteria such as:

A. Polluter pays. This principle allows adjusting each country's contribution to their greenhouse gas emissions, in such a way that the largest emitters contribute the highest financial quotas to the Fund. A reasonable sequence of data is available for CO_2 emissions from burning fossil fuels.
A country willing to use the Fund for reducing emissions from deforestation and degradation activities, must include its land use and land use change emissions for determining its contribution, in accordance with the inventories guidelines set out for the drawing up of National Communications.
With regard to historical emissions and cumulative effects, several possibilities are feasible:

1. To disregard cumulative emissions for determining contributions and take into account only current emissions.
2. To calculate the responsibility derived from historical emissions in terms of their contribution to increasing temperatures (*Brazil's Proposal*).
3. To calculate cumulative emissions from 1990, a general reference for National Communications, or 1992, when the *Convention* was adopted.

B. Equity. In considering equity, not only total emissions but also *per capita* emissions should be taken into account. The climate regime must induce a progressive convergence of *per capita* emissions in order to be equitable.

On the one hand, some emissions derive from productive processes linked to the satisfaction of a population's most basic needs and should be differentiated from those of countries with a much greater level of development. On the other hand, terrestrial and marine ecosystems may absorb a small amount of emissions without contributing to the growth of atmospheric concentrations. Every person on Earth should benefit equally from this environmental service.

C. Efficiency. Emissions can be differentiated in relation to the scale of the economic activity producing them. The *carbon intensity* (emissions per unit of GDP) of an economy reflects precisely this differentiation factor. Carbon intensity can be reduced by introducing technological improvements to increase efficiency. Nevertheless, it also can be induced through structural changes in the economy, such as greater development of the services sector, with its relatively lower emissions.

D. Payment capacity. A country's economic capacity to tackle climate change could be represented by an indicator such as GDP *per capita*, and in terms of the relative size of a national economy in proportion to the global economy. GDP can be expressed in terms of current prices or purchasing power parity, to take into account the relative purchasing power of each country's currency.

As with several other factors, it would seem equitable to agree that those with greater capacity make larger contributions to the *Fund*. Experience already exists in multilateral fora for determining contributions according to countries' capacity to pay (e.g. United Nations, World Bank, International Monetary Fund, among others).

Mexico is aware that the best objective formula for determining contributions will be that reached through consensus. This would be of utmost importance for providing stability and predictability to the financing scheme and potential alternatives to models of "voluntary contributions" for specific ends or "official development assistance", both of which will be maintained, being complementary to the proposed system.

It is suggested that negotiations focus first on general arrangements and organizational concepts, including the contributions structure and the complementary nature of the proposed *Fund*. Once the general scope and structure of contributions have been defined, the most important parameter will be determining the total scale of financial resources to be mobilized by the *Fund*. Whichever formula is adopted, the total amount of the *Fund* should be scalable and be increased periodically, without requiring the restructuring of the formula for relative contributions.

In its initial phase, it is expected that the Fund should mobilize no less than 10 billion USD per year. Several mechanisms could mobilize new financial resources that could be directed to the Fund, such as auctioning permits in domestic cap and trade systems in some developed countries, or the possibility of taxing air travel, without putting excessive pressure on public financing.

Developing countries that choose not to join the Fund would be excluded from its benefits, without any penalty. The creation and operation of the Fund should not represent a disadvantage to any developing country.

Distribution of resources for mitigation activities

In principle, all countries, developed and developing, could benefit from the Fund. The mitigation activities to be supported shall be defined by contributing countries, based on their own development needs and in accordance with their national circumstances. These activities should nevertheless

determine mitigation results that are **real, measurable, reportable and verifiable.** In this sense, it is necessary to adopt baselines derived from periodic emissions inventories with strict methodologies such as those used for National Communications under the Convention. This reference to baselines abates transaction costs and overcomes the need of much stricter additionality tests of CDM projects derived from their offsetting nature.

Activities eligible for receiving support from the Fund could be on a variety of scales, from isolated activities and projects to programs, sub-sectors, entire sectors or sub-national approaches. The Fund will thus be able to cover the intermediate scale between isolated projects, which would still be supported by the Clean Development Mechanism and the Joint Implementation Mechanism of the Kyoto Protocol, and whole economies -a scale corresponding to developed countries' national emissions mitigation commitments included in Annex B of the Kyoto Protocol.

The distribution of resources between proposals will be determined by the criteria and guidelines issued by the COP. For example, resources could be allocated in the first instance as a function of the funding given to a unit of emission reduction. A second possible criterion would be the total volume of emissions reductions.

Eligible activities could include the following:

- **"Grey" Agenda**
  - Increased energy efficiency in various sectors.
  - More efficient, non-renewable energy sources with lower emissions.
  - Large scale promotion of renewable energy sources.
  - Greenhouse gas capture and storage.
  - Reduction of fugitive emissions.
  - Programs for greener buildings, including reduced household energy consumption (energy efficient lighting and electric appliances).
  - National programs for methane management (landfills, livestock, mining).
  - Waste and residual waters management.
  - Changes in transport modal structure.
  - Introduction of low emissions vehicles.
  - Reduction of emissions from fluorinated gases.
  - Access to and development of clean technologies.

- **"Green" Agenda**
  - Reducing emissions from deforestation and degradation of forested lands.
  - Reforestation, afforestation and revegetation.
  - Forest fire prevention and control.
  - Reducing emissions from cropland soils.
  - Production and use of biofuels under strictly sustainable conditions.

To avoid imbalances, an upper threshold (e.g. 15% of the Fund's total amount) is proposed on withdrawals by any single developing country. If any developing country reaches that limit and uncommitted resources still remain, that country may request additional resources up to a maximum of the available yearly total.

It would be desirable to include among the criteria adopted for the selection and allocation process, one whereby those countries assuming greater commitments receive larger incremental resources.

While the CDM only relocates mitigation efforts, enabling the Parties in Annex B of the Kyoto Protocol to comply with their obligations without increasing the scale of mitigation provided for under this

instrument, the Fund would expand the overall scale of mitigation, by incorporating efforts undertaken voluntarily by developing countries and enhanced through incentives from contributor developed countries.
Developed countries will only be entitled to use a fraction of their contributions (e.g. 70%), so that developing countries may have access to financial resources much bigger than their own contributions. This must be the stronger incentive for developing countries´ participation in the *Fund*.

A part of the total contributions to the Fund could be set aside for the benefit of Least Developed Countries, which in general terms are likely to be most affected by climate change. Negotiations might include the possibility that Least Developed Countries could benefit from the Fund without making a contribution to it, as long as they comply with the general rules of its operation.

Possible future links with existing carbon markets
Whenever the Kyoto cap and trade scheme and the *Fund´*s operation stabilize, it might be useful to analyze whether mitigation efforts under multilateral supervision supported by the Fund could determine the accreditation of carbon units, subject to discount rules to be agreed upon to ensure the environmental integrity of the scheme. However, the fungibility of these carbon units with those from other instruments, such as the mechanisms established under the Kyoto Protocol, must be subject to careful consideration. Ensuring this capacity of exchange and avoiding double accounting for the same mitigation effort, would open the possibility of a major private sector participation in the *Fund* and establish functional connections between this scheme and those –existing or potential– based on cap and trade principles. In this case it would be necessary to establish a stricter additionality requirement for the activities of developing countries supported by the *Fund*, and to increase the commitments of developed countries to take into account the greater ease of compliance arising from the enlarged scale of the new instrument constituted by the *Fund*.

Derived Funds: adaptation and technology
Should mitigation efforts, adaptation, and the development, transfer and deployment of clean technologies be undertaken separately, financial mechanisms should be designed for each of these activities. The proposed *Fund* could establish linkages between mitigation, adaptation and technology transfer and development. To that end, it is proposed that all contributions received by the Fund should be subject to a double levy, to be determined through negotiations.

The first levy would be for the Adaptation Fund, at present only fed by contributions from the CDM operation (2% of the share of proceeds). This enlarged Adaptation Fund would maintain the scheme of governance agreed by Decision 1/CMP.3. Regardless of any other involvement with the Fund, developing countries particularly vulnerable to the adverse effects of climate change would benefit from the creation and operation of it. Within a year of operation it could generate resources to promote adaptation measures, which would be of a similar magnitude to those accruing to the current Adaptation Fund through the operation of the CDM over its entire first commitment period.

The second levy, similar in scope to the first, would enable the development of a Clean Technology Fund, to promote:

A. Technical assistance for project preparation, including those that can be referred to the Fund.
B. Transfer and development, demonstration and dissemination of technologies that are close to acquiring commercial status and that even in the short term, would allow beneficiary countries to reorient their development towards a lower carbon economy.

Governance
The Fund will operate under the aegis of the COP, and will be subject to general guidance from the latter steered through an inclusive and transparent governance scheme. All contributing and beneficiary

countries, developed and developing, will participate in the system. This arrangement must contribute to the achievement of a sense of collective ownership.

The operation of the Fund will depend on an Executive Council, constituted by representatives of all participant countries. They should be grouped in a balanced and practical way. The Council will have three independent counselors: i) a scientific counselor, ii) a counselor from the multilateral development banks, and iii) a counselor from social organizations. Developing countries will have the same relative weight and voice as developed countries. Being a financial instrument, country representatives to the *Fund* would be from Finance Ministries or their equivalent. The Executive Council will report annually to the COP of the *Convention*.

The Executive Council will have two support committees:

Scientific Committee. To be established in consultation with the Intergovernmental Panel on Climate Change, it will issue recommendations about policies, strategies and programs that the *Fund* can support.

Multilateral Banks Committee. It will issue recommendations in its field of competence.

Setting up the Fund should not lead to the creation of a new bureaucratic organization or an additional administrative burden, the COP will decide upon an existing multilateral institution that has global and financial experience in the field, for administering the Fund.

PAPER NO. 4A: NORWAY

Emissions of GHG from international maritime transport post 2012

AWG-LCA: Emissions of GHG from international maritime transport post 2012
Submission by Norway

Introduction

1 The ongoing IMO study on greenhouse gas emissions from ships has estimated the total CO_2 emissions from international shipping to be 847 mill tons in 2007. That constitutes 2.7 per cent of the global anthropogenic CO_2 emissions. That is a significant increase since the previous IMO study which estimated shipping's contribution to be 1.8 per cent of the total global emissions. The emissions are expected to increase significantly in the coming years due to expected increase in world trade. However, several technical studies, as well as information from the industry, have identified a large menu of emission reduction measures with a potential for significant reductions.

2 The purpose of this document is to identify a possible decision regarding reductions of greenhouse gas emissions from international shipping which should be taken by COP 15 in Copenhagen 2009.

The link between the role of the UNFCCC and the role of the International Maritime Organization (IMO)

3 The role of the International Maritime Organization as the global regulator for shipping is well established through the IMO Convention, the Law of the Sea (UNCLOS), and furthermore through approximately 50 mandatory instruments developed by the IMO. Several global conventions on environmental protection are established by the IMO, and almost all relevant environmental issues are covered in these conventions. The global co-operation between states on enhanced environmental protection regarding shipping have been constantly intensified the last years, leading to more strict environmental requirements and more robust mandatory mechanisms.

4 Activities within the IMO on reductions of GHG emissions from international shipping are well reported to various meetings under the auspices of the UNFCCC. At present the follow-up activity of the IMO Assembly Resolution (A.963(23) on "IMO Policies and Practices related to the Reduction of Greenhouse Gas Emissions from Ships") is intensified.

5 The overall international response to climate change is established through the UNFCCC. The most dominant element in this response is to control the level of total global anthropogenic greenhouse gas emissions through legally binding agreements.

6 A firm and coordinated global response to climate change should in a coordinated response from the shipping sector build upon the well established role of the IMO as the global regulator for international shipping. Consequently, international shipping should not be included in a post-2012 legal framework under the UNFCCC. However, an IMO framework on greenhouse gas emissions should have a policy direction on the output regarding total GHG emissions such a regime can be expected to achieve.

7 In the view of Norway, future IMO regimes on GHG emissions should not be departed from future UNFCCC legally binding agreements regarding the total output of emissions, i.e. the effectiveness of the total package of emission control measures for shipping should correspond to the effectiveness of the total post-2012 agreement within UNFCCC. This is important for two reasons

.1 total anthropogenic greenhouse gas emissions should be reduced in order to respond adequately to climate change, and reductions from international shipping is important in that respect; and

.2 the menu of mechanisms to be used in IMO legal instruments on greenhouse gases will be larger if such instruments includes caps which corresponds to agreed commitments in the post 2012 legal regimes under the UNFCCC.

8 COP may decide other expectations regarding the total emission reductions to be achieved by an IMO GHG framework for international shipping than those indicated by Norway. Such a policy decision may be stricter or more relaxed. In any case a decision of this nature will have the effect that the activities in the IMO on GHG emission reductions can not be claimed to be in limbo.

Proposal

9. In the view of Norway, the 15th Conference of the Parties to the UNFCCC in Copenhagen 2009 should adopt a decision which should include:

1. an emission target on total greenhouse gas emissions from international shipping; and
2. an invitation to the IMO to develop the legally binding regime(s) which is needed in order to meet such an emission target.

Such a decision by COP may include other aspects as well, such as co-operation with the IMO, but it is not necessary to consider the full content of possible future COP decision at this juncture.

PAPER NO. 4B: NORWAY

Auctioning allowances

Finance - AWGLCA
Norway's submission on auctioning allowances

1. Norway welcomes the conclusions from the meeting in Bonn in June where the Ad hoc working group on Long-term Cooperative Action under the Convention (AWG-LCA) invited Parties and accredited observer organizations to provide additional information, views and proposals on paragraph 1 of the Bali Action Plan as may be required for each session.

2. It is stated in the Bali Action Plan that there is a need to address "enhanced action on the provision of financial resources and investment to support action on mitigation and adaptation and technology cooperation". Improved access to adequate, predictable and sustainable financial resources is a crucial issue in the design of an agreement for Copenhagen 2009.

3. At the workshop on Investment and financial flows to address climate change organised for the AWG-LCA, Norway proposed that financial needs under the Convention could be financed through auctioning a share of assigned amount units of all Parties.

4. Due to its genuinely international character auctioning of allowances has the potential of overcoming domestic revenue problems. We therefore see auctioning as one particular promising option to generate adequate, predictable and sustainable financial resources.

5. In an emission trading system auctioning of emission quotas is a possible source of revenue. In cap and trade systems allowances are valuable, in other words assets. The yearly asset value of allowances is the product of the amount of allowances (the cap) and the price, where the cap is set by the total amount of allowances and the price will equal the marginal abatement cost. How many allowances that should be issued, will follow from overall emission targets (longterm and midterm).

6. A small percentage of this asset value could be auctioned directly or through a tax on issuance of the allowances, while a tax on transactions creates inefficiencies and should therefore not be an option. A two percent auctioning of the asset (similar to the CDM levy) can be used as an illustration. At this level one would generate an annual income of between 15 and 25 BN USD. The value of the asset (price time's quantity) is relatively robust to the actual cap. If the cap is set tight the price will rise and on the other hand if the cap is set more loosely the price will decrease.

7. The percentage or the number of allowances auctioned should be set to generate the amount of funding needed for the purpose in question. The amount of allowances auctioned could be predefined by a number of allowances, by a fixed percentage of the total amount or a predefined revenue requirement. One could also establish a process with the aim of deciding the exact amount at a later stage.

8. Auctioning of allowances could be a source of revenue for different kind of financial needs under the Convention. There are different studies on financial needs for developing countries for taking adaptation actions. In one UN study the need is estimated to be in the range of USD 28-67 BN in additional investment and financial flows in developing countries. non-Annex I Parties by 2030. The decision from Bonn on updating this UNFCCC paper on investment and financial flows to address climate change will give valuable input in the discussions of how much funding that will be needed for adaptation and mitigation actions.[1] The proposal doesn't rule out the possibility of raising funds for other

[1] http://unfccc.int/files/cooperation_and_support/financial_mechanism/application/pdf/background_paper.pdf

purposes than adaptation, such as technology development and efforts to reduce deforestation in developing countries.

9. The Norwegian proposal of withholding a small portion of permits from national quota allocations, and auction it by an appropriate international institution, should be further discussed and elaborated in the upcoming meetings of the AWG-LCA. This includes discussions on modalities for determination of how many allowances that should be auctioned, for what purposes financial recourses raised by this mechanism should be allocated to and under which principles a fund will be established and organised (governance etc).

PAPER NO. 5: REPUBLIC OF KOREA

Market-based Post-2012 Climate Regime: Carbon Credit for Nationally Appropriate Mitigation Actions

Market-based Post-2012 Climate Regime: Carbon Credit for NAMAs
Republic of Korea

1. **Background:**
   - **Incentive for Mitigation Actions of Developing Country**: In addition to deep target for Annex 1, providing incentives and encouraging developing countries in **Nationally Appropriate Mitigation Actions (NAMA)** supported and enabled by technology, financing and capacity-building, in a **MRV (Measurable, Reportable, Verifiable) manner**, as defined by Bali Action Plan Para. 1. (b) (ii), is one of the important elements in designing post-2012 climate regime.
   - **Finance & Technology Transfer**: Designing **a well-functioning mechanism to transfer financial resources and technology** to developing countries to support their NAMA is another important element.
   - One of the crucial factors in up-scaling financial flows to mitigation actions in developing countries is improving **commercial viability of investments.**
   - **What is lacking is not money and technology** but **a climate regime which could improve commercial viability of investments for mitigation**. If we could design a climate regime which could improve commercial viability of mitigation investment, then the market will drive finance and technology to flow to mitigation actions in developing countries.
   - NAMAs has to be encouraged by incentives. Post-2012 climate regime has to provide **systematic incentives** for NAMAs of developing countries.

2. **Incentivizing NAMA by awarding Carbon Credit:**
   - Contrary to general perception that finance & technology has to be secured in advance to take any NAMAs, **climate actions can be taken even without money and technology secured in advance** if mitigations done in a MRV manner from NAMA could be awarded carbon credits.
   - **What you need is just project proposals for NAMA. You can submit project ideas to banks to get loans and initiate NAMAs and pay the loan back with the revenue from the sales of the carbon credit generated from NAMAs. This approach is already working in the case of unilateral CDM which is now more than half of all CDM projects.**
   - Many developing countries are already taking various nationally appropriate mitigation actions to reduce GHG emissions.
   - However, **current climate regime does not have any institutional mechanism to recognize and encourage such voluntary and unilateral actions.**
   - **NAMAa implemented in a MRV manner should be recognized and rewarded with carbon credit**, so that they could sell these credits and **improve commercial viability** of their investment in mitigation actions.

3. **Carbon Trading for Post-2012 Climate Regime**
   - Cost of 1 ton of CO2 emission reduction is only a few dollars for many developing countries or around 20 USD while for developed countries it ranges from 153 USD to 234USD.

- **Scaling up Finance & Technology Flow**: If we could design a climate regime which allows developing countries to sell carbon credit generated from their NAMA done in a MRV manner, then the revenue from the sales of these credits will scale up finance and technology flow to the mitigation projects in developing countries.
- **Reduction of Global Mitigation Costs**: At the same time, it will reduce the total cost of global mitigation. According to a certain model, global trading system which includes developing countries could reduce global mitigation costs by 70%.[1]

4. **Additional Deeper Cut/Target from Annex 1 countries:**
   - In order to make such a global carbon trading scheme to function, **there has to be demands for carbon credits from NAMAs** of developing countries.
   - Annex 1 countries could accept **additional deeper target** in addition to their target based on the potential mitigation from domestic actions to create demands for the credits from developing countries.
   - **Supply and Demand:** Balancing supply and demand of carbon credit is critical in making carbon market to function properly. Careful study and analysis is necessary on how to maintain the balance of potential credit supply and demand which could be further elaborated in due course.

5. **Additional deeper cut: Not New and Additional burden for Annex 1**
   - Annex 1 countries already agreed to support mitigation actions of developing countries by transferring finance and technologies. Thus buying carbon credit is not new or additional burden for Annex 1.
   - Buying carbon credit at a cheaper price than the cost of domestic mitigation within Annex 1 will be beneficial for Annex 1 credit buyers.
   - Many developed countries are announcing that they are going to offer varying size of climate funds to support developing countries. Accepting a deeper target to buy credit from developing countries will not be much different than offering funds.
   - The idea of issuing bonds to support mitigation of developing countries is an option. But awarding credit will be simpler, efficient and effective.

6. **Carbon Credit as Finance and Technology Transfer Mechanism**:
   - Well functioning finance and technology transfer mechanism for NAMAs of developing countries is a key element in designing post-2012 climate regime.
   - **Engaging Private Sector:** Major portions of finance and technology belong to private sector. Public sector has a limited role in transferring finance and technology to developing countries. Current approach of demanding the governments of Annex 1 to be the driver of finance and technology transfer to developing countries is not realistic as greater portions of finance and technology are in the hands of private sector.
   - The size and scale of ODA is limited and not sufficient. Public funds can play an important role. However, public funds will not be big enough to support all financing needs of developing countries.
   - Giving a price on the mitigation of carbon and leave it to the market to operate the trading of carbon credits will be more efficient in terms of costs of operation and in terms of efficiency of transferring financial resources and technologies to developing countries.
   - While public funds from the contributions from the governments will be constrained by the tax payers and budget, carbon market is not.
   - However, **public funds** could play an important role in addressing the financial needs of developing countries for **adaptation** for which the public sector has to play a more leading role, not like the **mitigation** for which the **private sector** is playing the major role.

[1] Key Elements of a Global Deal on Climate Change: Nicholas Stern, Page 20.

7. **ETS for EU. Then, why not Global Carbon Market for developing countries?**
   - ETS which is a carbon trading scheme for EU is being reported to function efficiently in minimizing the costs of mitigation among European countries.
   - Then why not expand Global Carbon Market to embrace developing countries as main player?
   - Developing countries can be the driver of global carbon market if they could generate carbon credits from their NAMAs done in a MRV manner.

8. **What is the difference between CER from CDM?**
   - In fact, current CDM is already functioning as carbon credit mechanism for developing country projects.
   - However, the CDM in its current form of project-specific nature is not able to generate financial flows needed under a "global deal." It is estimated that climate stabilization would require 20-75 billion USD by 2020 and up to 100 billion USD by 2030. The capacity of current CDM is about 400 projetcs registration per year and 6 billion USD at current carbon prices.[2]
   - Awarding carbon credit for NAMAs will be a concrete idea to up-scale current CDM in a more enhanced manner.
   - Programmatic and sectoral CDM based on efficiency standard could be an option to operationalize the idea of credit for NAMAs in a wholesale approach.[3]
   - In balancing the quality of credit from NAMA and project-based CDM, we can differentiate the price of credits depending on the quality.
   - **As NAMAs will be taken in the context of sustainable development by developing countries**, **carbon market based on NAMA carbon credit will be more conducive to sustainable development**.

9. **Is Carbon Credit only carbon off-setting?**
   - Within the context of current carbon market operations based on current CDM architecture, that might be true. But if we award carbon credit for NAMAs and if Annex 1 takes on additional target, then these additional target is net additional global reduction, not just carbon off-set.
   - **Moreover, the quantity of additional net global reductions could be controlled by the amount of additional target set by the Annex 1 countries themselves.**
   - **Discounting of Credit: If certain portion of the credit is being discounted and retired from the market, those portions of credit not sold in the market will be net global net reduction.** Such discount could stabilize the price of carbon credit in the market by controlling the supply of credit. Discounting of credit could be an alternative option of generating net global reduction without using target method. While the reduction from target method will be based on fictitious BAU and emission trajectory difficult to predict, the reductions from the discounting of credit will be far more concrete and tangible and directly linked with climate action while as the reductions from the target is difficult to prove direct linkage with climate action. .

10. **Manipulating carbon credit from NAMAs to improve commercial viability of investments for renewable energy projects and actions**.
    - If we multiply carbon credit from renewable energy projects or actions, rather than multiplying CERs from HFC destructions, then commercial viability of investments for

[2] Ibid. Page 15.
[3] Ibid. Page 16.

renewable energy could be improved and boost investments for renewable energies which is at the moment suffering from a low commercial viability and low investments.

- Implication of this example is that if we properly manipulate carbon credits and carbon markets with innovative designs, then we can harness market dynamism in driving investments and actions for mitigation.

11. How about LDCs and SIDS with limited potential for NAMAs?

- Geographical uneven distribution of mitigation projects is already apparent in the case of CDM. It would not be much different even in the case of credit for NAMAs.
- However, carbon credit from NAMAs could play a positive role in generating funds for LDCs and SIDS or even for adaptation if we allocate certain share of proceeds from the revenue from NAMA credit to support LDCs and SIDS as in the case of CER from CDM is allocating proceeds for adaptation fund.

12. How to operationalize carbon market for NAMA?

- We already have rules and methodologies to operate project –based CDM. Methodologies. The rules to operationalize NAMA credits could build on existing CDM rules and criteria.
- **We could simply agree on the principle that verifiable mitigations from NAMAs could be awarded carbon credit as part of package for the Global Deal to be finalized by the end of 2009.** Details of methodologies necessary for the operation of NAMA credit scheme could be elaborated after 2009 as was the case of the CDM.

13. Potential of Carbon Market and Market-based Mechanism for Post-2012 Climate Regime for Developing Country Participation.

- If we award carbon credit in a up-scaled and wholesale manner for the verifiable mitigations from NAMA of developing countries and if Annex 1 would take deeper target to generate demands for these credits, thus expand global carbon market so that developing countries could play an active role,

then commercial viability of investment for mitigation actions in developing countries will be improved and financial flows for **the mitigation of developing countries in the form of NAMAs will be scaled up.**

- **Global carbon market for credit from NAMAs will function as an effective mechanism for finance and technology transfer.**

- **If we could allocate certain share of proceeds from carbon credits from NAMAs to adaptation funds,**

Then, this scheme could potentially make meaningful contributions in addressing all 4 issues of climate change, namely, **Mitigation (NAMA), Finance & Technology Transfer and Adaptation.**

PAPER NO. 6A: SINGAPORE

Shared vision

THE AD HOC WORKING GROUP ON LONG-TERM COOPERATIVE ACTION UNDER THE CONVENTION

Singapore's Submission on Shared Vision

1 Climate change is a global challenge which affects all countries. It is a problem which has to be addressed by long-term cooperative action by all countries, in accordance with the principle of "Common but Differentiated Responsibilities (CBDR)." In this respect, action on mitigation must recognise the importance of economic growth and reduction of poverty in developing countries.

2 Developed countries, which are responsible for the bulk of historical greenhouse gas (GHG) emissions, have to take the lead in cutting emissions. The developed countries also possess greater technological and financial capacities to implement emissions reduction measures. A commitment to emissions reduction by all developed countries must, by necessity, be agreed to and implemented.

3 Developing countries also have an important role to play in this effort. Bearing in mind the principle of CBDR and the vital importance of economic growth, developing countries should take on voluntary mitigation actions in the context of sustainable development, such as through energy efficiency. This will allow developing countries the flexibility to adopt practical measures to mitigate the growth of emissions without adversely affecting economic development.

4 Actions on mitigation must be equitable and must fully take into account the diverse and unique national circumstances of developing countries. Full consideration must be given to the specific needs and concerns of developing countries as spelt out in Articles 4.8 and 4.9 of the Framework Convention. These Articles are unequivocal recognition of the unique circumstances of developing countries.

5 Similarly, Article 4.10 which gives special consideration to countries, particularly developing countries, which face serious difficulties in switching to alternatives from fossil fuels must be fully taken into account. Small states, in particular, are constrained by their size from having the flexibility of using alternative sources of energy to reduce their dependence on fossil fuels.

6 Any long-term cooperative action should also include enhanced action on adaptation to the adverse effects of climate change. In particular, the small island developing states (SIDS) are most vulnerable to threats from the effects of climate change such as rising sea levels and extreme weather events. They will require urgent and immediate assistance for implementing effective adaptation measures.

7 In the effort to give full consideration to what actions are necessary to meet the specific needs and concerns of developing countries arising from the adverse effects of climate change, developed countries should provide developing countries with adequate, predictable, and sustainable financial and technical support and where appropriate, technology transfer in accordance with Article 4.3 of the

Convention. It is essential that information on (i) the availability of the technology; (ii) the costs of adopting the technology; (iii) the funds available to support mitigation actions in developing countries, and (iv) how to access these funds (such as eligibility criteria and procedures) are properly documented and readily available when needed. However, as far as possible, new bureaucracies and organisations should be avoided so that available financial resources may be effectively utilized. Where possible, existing international financial organisations should be used and their lending policies tailored to meet the specific requirements of climate change in developing countries.

8 An international cooperative effort in which every country can effectively play a part in addressing climate change will be necessary. Singapore is prepared to do its part if there is a global agreement. We are fully committed to implementing the Bali Action Plan to enable the full, effective and sustained implementation of the Convention.

PAPER NO. 6B: SINGAPORE

Mitigation

THE AD HOC WORKING GROUP ON LONG-TERM COOPERATIVE ACTION UNDER THE CONVENTION

Singapore's Submission on Mitigation

1 In response to the invitation by the AWG-LCA for Parties to submit ideas and proposals on elements contained in para 1 of the Bali Action Plan, Singapore's views on mitigation with respect to para 1(b) (ii) are given in the following paragraphs:

(I) Principles

2 Mitigation efforts must take fully into account:

(a) The right to economic development and poverty eradication which are essential for all countries, particularly developing countries;

(b) The principle of common but differentiated responsibilities and respective capabilities contained in Article 3.1 of the Convention;

(c) Article 3.3 of the Convention, which states that policies and measures should be cost-effective so as to ensure global benefits at the lowest possible cost. These policies and measures should be based on sound economic principles and take into account the different socio-economic contexts of the Parties;

(d) Article 3.5 of the Convention, which highlights that measures taken to combat climate change should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade; and

(e) Articles 4.8(h) and 4.10 of the Convention which, among others, call for consideration in the implementation of the commitments of the Convention to be given to the situation of Parties which are highly dependent on fossil fuels and have serious difficulties in switching to non-fossil alternatives.

(II) Singapore's efforts at mitigation

3 Despite its small size and high dependence on fossil fuels for its energy generation, Singapore has over the years closely adhered to the need for sustainable development. In this regard, we have undertaken various Sustainable Development Policies And Measures (SD-PAMs) to mitigate and reduce the growth of greenhouse gas emissions. This effort was accelerated from 2000 in sectors such as energy, building, transport, forestry and waste management. As a result of these mitigation actions, we have by 2006 reduced our emissions intensity by 30% below 1990 levels. The actions are listed below:

(i) Liberalisation of the Energy Sector, Encouraging R&D, and Maintaining Market-Based Pricing

4 Since 2001, Singapore has moved significantly from fuel oil to natural gas for power generation. As the use of natural gas emits 40% less carbon dioxide than fuel oil per unit of electricity

generated, this has enabled Singapore to lower its emissions from the power sector. The liberalisation of Singapore's energy market since 1995 encouraged our energy companies to bring in highly-efficient combined gas cycle turbines (CCGTs) and co-generation technologies. By 2006, nearly 80% of the electricity in Singapore was generated by natural gas using CCGTs. Our share of natural gas in power generation mix is amongst the world's highest.

5 Singapore is also encouraging the setting up of research institutes and test-bedding platforms for improving the performance and cost-effectiveness of alternative energy sources such as solar energy, and clean technologies applicable to energy management, urban solutions and sustainable development. We have committed more than S$350 million (US$257 million) for this purpose. This comprises S$170 million (US$125 million) set aside by the National Research Foundation for research into clean energy, with a focus on solar energy, and S$180 million (US$132 million) from funds pertaining to sustainable development and energy technology. The development of environmentally sound technologies, know-how, practices and processes is a component of our mitigation efforts. In the long term, lowering the costs of such technologies will also facilitate more widespread transfer and adoption.

6 Singapore does not subsidise energy usage. This has provided the market incentive for consumers to be more energy efficient and reduce the use of energy. We have also established the Energy Efficient Singapore (E2 Singapore) plan. E2 Singapore, which is driven by the inter-ministry Energy Efficiency Programme Office (E2PO), promotes the adoption of energy efficient technologies and measures, develops local capabilities in energy efficiency, raises public awareness of energy efficiency, and supports research and development in efficient technologies.

(ii) Pursuing Sustainable Development Policies and Measures in Buildings and Transport

7 Public housing estates, which house about 80% of Singaporeans, are designed and built to make better use of natural ventilation and to conserve energy. Amenities and services in the estates are integrated to minimise traveling. Building requirements and codes are also regularly reviewed to take into account energy efficiency. Since 2008, regulations have been put in place to require new buildings and those undergoing major retrofitting to meet minimum green building standards. This makes Singapore one of the first few cities in the world to mandate green buildings. A Green Building Masterplan has been introduced with a range of initiatives and incentives to further encourage the development of green buildings.

8 Over nearly 30 years, Singapore has adopted ownership and congestion control measures, complemented by policies to promote the use of public transport, including developing an extensive rail network coverage. This has enabled us to mitigate the growth of emissions from domestic transport. The Area Licensing Scheme (ALS) implemented in 1975 and the Electronic Road Pricing (ERP) system which succeeded it in 1998, set a price for congestion, thereby reducing vehicle trips and encouraging the use of public transport. Since 1990, the Vehicle Quota System (VQS) has also limited the total car population. We have also implemented policies to promote the use of green vehicles which are more fuel efficient and emit less pollutant than conventional vehicles. The Government will continue promoting public transport as a choice mode given that it is the most efficient mode in densely-populated and land-scare Singapore. Coupled with the promotion of green vehicles and the improvement of fuel economy, such policies and measures allow Singapore to balance our development needs with environmental objectives and reduce the growth of emissions.

(iii) Waste Management: Energy Recovery from Waste

9 Singapore has put in place a management system to handle solid waste and wastewater and to recover energy from waste treatment. Organic solid waste is incinerated and the heat produced is used to generate electricity. Similarly, energy is recovered during wastewater treatment through the biogas produced. These efforts reduce methane emissions from landfills, and also meet development objectives of increasing resource efficiency and prolonging the lifespan of limited landfills.

(iv) Protecting and Enhancement of Carbon Sinks

10 Despite our size constraints, Singapore has identified 19 nature areas for conservation of about 3,100 ha or 5 per cent of Singapore's total land area. There are also an increase of parks, gardens, street plants and a network of green links. Singapore has planted nearly a million trees and more than eight million shrubs in public spaces island-wide since 1963 under the "Tree Planting" campaign. There are also on-going efforts to set aside private lands for green buffers and the greening of buildings under our "City within a Garden" initiative. Through these efforts, the green cover in Singapore has increased to almost 50% of our island-state. This is an increase of about 10% over the past 20 years. This despite a 70% growth in population.

11 Given the importance of tropical forests as carbon sinks, Singapore supports national, regional and international efforts to preserve and restore forests. On a bilateral basis, we have collaborated with Indonesia's State Ministry of Environment and the Jambi Provincial Government to encourage sustainable forest management and land clearing practices. Such efforts include *inter alia*, conducting capacity building programmes, developing capabilities for air quality and/or weather monitoring and using existing technologies to improve the productivity of certain fishery and agricultural activities to create a more sustainable, alternative livelihood for the farmers.

(III) Cooperation in Sustainable Development

12 Singapore has put in significant efforts over the years in mitigation actions, including projects under SD-PAMs. Our efforts in reducing the growth of emissions may be relevant to other developing country Parties which are exploring ways to balance economic development with environmental sustainability. In this respect, Singapore embarked on a bilateral cooperation project with China in 2007 to jointly develop an eco-city in Tianjin called the Sino-Singapore Tianjin Eco-city. Involving many Singapore agencies, this government-to-government project, with endorsement at the highest level of both governments, demonstrates the determination of both countries in tackling global climate changes, conserving resource and energy, and building a socially harmonious society. It has a list of 26 Key Performance Indicators, jointly worked out by the two countries, to guide its planning and development. When completed in 10 to 15 years' time, it is expected to be home to about 350,000 people and will serve as a model for sustainable development for other cities in China and in other countries. Singapore stands ready to exchange experiences and knowledge on mitigation with other developing countries, particularly small island developing countries which are in similar situation from the effects of climate change.

PAPER NO. 6C: SINGAPORE

Adaptation

THE AD HOC WORKING GROUP ON LONG-TERM COOPERATIVE ACTION UNDER THE CONVENTION

Singapore's Submission on Adaptation

1 This submission on adaptation is made in response to the invitation in AWGLCA/2008/L.5 for Parties to submit ideas and proposals on the elements contained in paragraph 1(c) of the Bali Action Plan.

2 Singapore is firmly committed to understanding the impacts, assessing the vulnerability, and managing the risks associated with climate change. Unless properly managed, these factors can have adverse effects not only within countries but also across national borders. We welcome this opportunity to provide information on key considerations to support the work of the AWG-LCA on adaptation, as well as relevant programmes and activities which have been taken in Singapore. In this connection, the experience of Singapore in adaptation may be relevant to other Parties. Singapore stands ready to exchange experiences and knowledge on adaptation measures with other developing countries, particularly small island developing countries which face similar situations from the effects of climate change.

(I) Principles of Adaptation

3 As highlighted in Articles 4.3, 4.4, 4.5, 4.7, 4.8 and 4.9 of the Convention , developed countries, particularly Annex II countries, have a key role to play in helping developing countries adapt to the adverse effects of climate change, through funding, insurance, and the transfer of technology Such assistance should be expanded and carried out expeditiously. To facilitate access to funding for adaptation by developing countries, information on pledges by developed countries on the financing and technology for adaptation, including the eligibility criteria to access these funds, should be collated and presented in a clear and coherent manner. Funding for adaptation assistance should also be additional to existing ODA commitments.

4 Adaptation measures should include both improvements to the physical infrastructure as well as means to deal with the socio-economic impacts of climate change on the population. Where appropriate adaptation measures should form part of disaster management plans so as to avoid the more pernicious effects of climate change. There will also need to be improved understanding of financial risk management frameworks and mechanisms such as insurance to manage and reduce financial risks.

(II) Vulnerability Assessment in Singapore

5 Singapore is a small densely populated tropical island which is relatively low-lying. The total land area of Singapore is only about 700 sq km, much of which is less than 15m above sea level. With a population of about 4.6 million, Singapore is one of the most densely populated countries in the world.

6 A vulnerability assessment by the National University of Singapore and participated by several IPCC experts has been commissioned and is expected to be completed in 2009. The vulnerability study will cover areas such as temperature rise and sea level rise. It will determine the specific local effects and impacts of climate change on Singapore and would assess what more needs to be done in adaptation.

7 To build up expertise in understanding the impacts, assessing the vulnerability, and managing the risks associated with climate change within the Southeast Asia region, the Earth Observatory of Singapore (EOS) was recently set up to help Singapore and Southeast Asian countries. It will anticipate and adapt creatively to environmental threats including those brought about by climate change.

(III) Adaptation in Singapore

8 Adaptation measures have been progressively put in place over the last several decades. A constant review is made to the existing infrastructure to assess its adequacy in meeting the adverse effects of climate change such as temperature rise. These reviews will help to identify new measures needed and establish national systems to actively monitor and manage these adverse impacts. Some of the measures Singapore has taken with regard to adaptation are given below.

9 **Flooding**. A rise in sea level will make it more difficult for rainwater to drain into the sea. This will aggravate inland flooding. Since 1991, Singapore has required new land reclamation projects to be built to a level 125 cm above the highest recorded tide level. A deliberate policy to raise the level of low-lying areas in conjunction with redevelopment proposals has also been put in place. This will help Singapore adapt to projected sea level rise made by the IPCC.

10 Furthermore, drainage infrastructure has been constructed to reduce flood-prone areas in Singapore from 3200 ha in the 1970s to 124 ha. With the completion of the Marina Barrage (which will dam the Singapore river thereby creating a freshwater reservoir), the development and improvement of drainage infrastructure (e.g. widening and deepening of drains and canals), as well as other flood alleviation projects, the flood prone areas will be further reduced to 66 ha by 2011. This will reduce the possibility of increased inland flooding due to climate change.

11 **Coastal land loss**. To protect against coastal erosion and land loss, hard wall or stone embankments have been constructed along 70% to 80% of Singapore's coastal area. The government is also looking at adapting to sea level rise through the protection of our foreshore and coastal areas. As necessary, existing revetments will be strengthened and reinforced while natural areas will be protected using different coastal defence systems.

12 **Water Resources**. A rise in sea level can result in saltwater intrusion of Singapore's coastal reservoirs. Plans are in place to raise the gate structures of the dams as necessary.

13 Rising global temperatures can also change rainfall patterns and affect the amount of water stored in reservoirs. The unpredictability in rainfall can cause difficulties in capacity planning of

water resources. With the diversification of Singapore's water resources to include NEWater[1] and desalination, we have increased the resilience of our water supply as these new sources are not dependent on rainfall.

14 **Heat stress**. Warmer temperatures due to both climate change as well as the urban heat island effect can lead to increased energy demand. Higher annual temperatures may also mean more frequent and severe episodes of warm weather, leading to increased occurrences of heat stress and discomfort, particularly among the elderly and the sick.

15 Measures to lower ambient temperature include increasing the amount of greenery in the city and modifying building layout and designs have been taken. Plans have been drawn up to provide greenery island-wide, such as parks and green open spaces, and planting along roads and around developments. About one million trees and more than eight million shrubs have been planted in Singapore over the years of which 62,000 trees were planted in 2006 alone. We have also been promoting rooftop and vertical greenery on our residential and commercial buildings through planning guidelines and incentives. We are in the process of introducing rooftop greenery to multi-storey residential buildings and carparks where feasible.

16 **Public health impact**. Singapore is situated in a region in which vector-borne diseases, particularly dengue, are endemic. Dengue patterns are affected by many factors, including climate. Singapore is studying the link between climate factors such as temperature, humidity and rainfall with dengue cases. Preliminary results indicate that the number of dengue cases in Singapore is correlated to the ambient temperature. To address the spread of dengue in Singapore, we have put in place a comprehensive mosquito surveillance, control and enforcement system, which includes pre-emptive action to suppress the mosquito vector population, dengue-related research and a review of building designs to reduce potential breeding habitats for mosquitoes.

(IV) Singapore's International Efforts

17 Singapore has shared its experience in implementing adaptation measures with other developing countries, particularly those which share the similar physical and geographical features. Since 2000, Singapore has organised training courses in Environment and Urban Development for over 2,000 officials from other developing countries. This has been carried out through the Singapore Cooperation Programme and other technical assistance programmes at the cost of US$4.8 million. Such training courses included courses on urban environmental management, urban and city management, developing and managing a garden city, sewage and wastewater management, pollution control, town planning, sustainable development, environmental management, and 24/7 water supply and distribution management. As a developing country, Singapore will continue to share its experience in adaptation measures with other developing countries and to assist them through such transfer of technological knowledge and capacity-building efforts.

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[1] NEWater is treated used water that has undergone stringent purification and treatment process using advanced dual-membrane (microfiltration and reverse osmosis) and ultraviolet technologies.

PAPER NO. 7: URUGUAY

Enhanced national/international action on mitigation of climate change

Ad Hoc Working Group on Long-term Cooperative Action under the Convention
Third Session. Accra, Ghana

Item 3b of the Agenda
Enhanced national/international action on mitigation of climate change

Submission from Uruguay

August 8th, 2008

Following the invitation contained in the document FCCC/AWGLCA/2008/L.5, paragraph 4, and FCCC/AWGLCA/2008/8 paragraph 26, Uruguay would like to present its views regarding ideas and proposals on the subjects of the AWG-LCA workshops scheduled for 2008.

Considering the request from the AWGLCA to the Secretariat contained in the document FCCC/AWGLCA/2008/L.5, paragraph 6 (a), to prepare a technical paper on challenges and opportunities for mitigation in the agricultural sector for its consideration at the fourth session of the AWGLCA.

Taking into account:

- the submission dated July 16th 2008 made by Argentina, Australia, Canada, Chile, Environmental Integrity Group, European Community and its Member States, Iceland, Japan, New Zealand, Norway, Paraguay, Russian Federation, South Africa, United States and Uruguay, referring to the above referred Technical Paper on Challenges and Opportunities for Mitigation in the Agricultural Sector;

- the submission made by Uruguay on March 16th 2008 on the possible future work on mitigation, in particular for non-CO2 emissions from livestock agriculture sector (methane from enteric fermentation of cattle and nitrous oxide from agriculture soils);

- the recent LEARN (Livestock Emissions & Abatement Research Network) workshop held in Montevideo (21 to 24th July 2008) on Measurement and mitigation of greenhouse gasses in grazing livestock systems, where more than 60 scientists and researchers from more than 13 countries participated with the aim to exchange experiences in order to improve understanding and quantification of non-CO2 greenhouse gas emissions from animal agriculture;

Uruguay considers that all the above mentioned elements will contribute together with the technical paper in the discussion of this issue in Poznan. In consequence, Uruguay proposes to hold a workshop in Poznan at the 4th session of the AWGLCA on Mitigation in the Agricultural Sector.

Uruguay offers to present its national experience in developing national specific emissions factors for methane from enteric fermentation and nitrous oxide from agriculture soils, in the understanding that is very important to further work on these emission factors due to their high uncertainties (almost 50%), in order to better understand the challenges and opportunities for Mitigation in this sector.

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