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Item 7 of the provisional agenda
Development and transfer of technologies

Views on the areas of focus set out in section IV of the terms of reference for the review and assessment of the effectiveness of the implementation of Article 4, paragraphs 1(c) and 5, of the Convention agreed at the twenty-ninth session of the Subsidiary Body for Implementation

Submissions from Parties and relevant organizations

1. The Conference of the Parties, by its decision 2/CP.14, paragraph 3, invited Parties and relevant organizations to make submissions to the secretariat, by 16 February 2009, in accordance with paragraph 9 of the terms of reference for the review and assessment of the effectiveness of the implementation of Article 4, paragraph 1(c) and 5, of the Convention, contained in the annex to document FCCC/SBI/2008/L.28.

2. The secretariat has received 11 such submissions. In accordance with the procedure for miscellaneous documents, these submissions are attached and reproduced* in the languages in which they were received and without formal editing.

3. The secretariat has also received submissions from accredited non-governmental organizations. In line with established practice, the secretariat has posted these submissions on the UNFCCC website at <http://unfccc.int/parties_observers/ngo/submissions/items/3689.php>.

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

AUSTRALIA

Technology Cooperation

Review and Assessment of the Effectiveness of the Implementation of Article 4, paragraphs 1(c) and 5, of the Convention

Submission to the SBI

Further to Decision -/CP.14 on the Development and Transfer of Technologies, this submission contains detailed input to the Secretariat on *Section IV – Areas of Focus*.

The primary responsibility for promoting enhanced technology outcomes under the Convention and the framework of 3/CP.13 lies with Parties and their respective national frameworks, supported and facilitated by actions within and external to the UNFCCC.

The Terms of Reference of the Review note that the majority of the development, diffusion and deployment of environmentally sound technologies (ESTs) occurs outside the UNFCCC. This activity, facilitated by the policies, measures and frameworks established by Parties, directly contributes to the commitments under Article 4, paragraphs 1(c) and 5 of the Convention. External processes should be given proportionate coverage by the Review.

Technology development and transfer encompasses all the elements of the innovation cycle, from research through to demonstration and commercial deployment of both mitigation and adaptation technologies. It also includes the processes, skills, know how, and infrastructure to support technology outcomes as well as the enabling environments needed to promote sustainable public and private investment.

Australia's commitment to promoting enhanced international technology cooperation is strong and continues to grow.

Specific comments on Areas of Focus for the Review

(a) ***Review the extent to which actions have promoted and supported institutional systems and regulatory and legislative frameworks needed to scale up development and transfer of technologies*.**

The provision of sound institutional, regulatory and legislative/policy frameworks at the national and sub-national level is essential in generating, directing and maintaining enhanced private and public sector investment in technology. Without these frameworks investments will tend to be ad hoc and concentrated on one-off projects rather than driving sustainable broad scale development and diffusion within coherent policy objectives. This is true for developed as well as developing countries.

Australia is implementing a comprehensive set of climate change, energy and technology based legislative frameworks that will drive investment in low emissions and adaptation related

activities over the coming decades. These frameworks are also supported by targeted policies and measures which, when taken together, create the "push" and "pull" incentives for technology development and deployment. Key elements in Australia's response include:

- A proposed cap and trade emissions trading scheme (the Carbon Pollution Reduction Scheme) due to commence in 2010. The scheme, which will cover 75 per cent of Australia's emissions, is one of the most ambitious in the world, and serves to incentivise investment in clean technology;
- A 20 per cent National Renewable Energy Target for 2020 and renewable energy trading certificate scheme which will drive investment in renewable energy;
- Further reform of Australia's national energy markets to promote open, integrated and efficient markets that are able to respond to disruptions, structural change and future demand growth;
- Research and development incentives (tax and direct measures);
- Australian Research Council and Cooperative Research Centres, which foster collaborative partnerships between researchers and end users;
- IP Australia, an agency responsible for administering patents, trademarks, designs and plant breeder's rights, which contributes to the improvement of Australian and international IP systems
- The Commonwealth Scientific and Industrial Research Organization (CSIRO) *National Research Flagship* program, which is designed to integrate, focus and direct national scientific resources.

Overcoming areas of regulatory uncertainty is also essential for encouraging long-term investment decisions, particularly for large scale technologies. For example, technologies such as carbon capture and storage (CCS) require a new and complex regulatory framework. In November 2008, the Australian Parliament passed pioneering legislation to establish the world's first regulatory framework for CCS. The Offshore Petroleum Amendment (Greenhouse Gas Storage) Bill 2008 establishes a new range of offshore titles providing for the transportation by pipeline and injection and storage in geological formations of carbon dioxide and potentially other greenhouse gases. The legislation deals primarily with the provision of access and property rights for greenhouse gas injection and storage activities in Commonwealth offshore waters and provides a management system for ensuring that storage is safe and secure.

Australia also recognizes the importance of fostering innovation as it drives knowledge creation, cutting edge science and research, international competitiveness and greater productivity. In 2008 the Australia Government undertook a review of its National Innovation System. The review report has 72 recommendations that range across the components of an effective system, focusing on innovation in business, strengthening people and skills, excellence in national research, information and market design, and taxation. The Government is considering the Review's recommendations in preparing a 10 year White Paper on Innovation which will be made available early in 2009.

(b) ***Review the range of practical actions taken and identify possible actions to promote innovative public and/or private partnerships and cooperation with the private sector, and consider steps that governments, the business sector and academia can take to facilitate effective participation by the private sector.***

The private sector is, and will continue to be, the primary source of new technologies, processes and know-how. However technology development and diffusion can in some cases be accelerated through support from government and public sector institutions to share

technical and financial risks, or to address market failures which act to inhibit private sector activity.

Australia is focused on developing a balanced portfolio of technology interests which accord with national priorities, including carbon capture and storage, renewable technologies and adaptation related research. Much of this effort is focused through developing collaborative relationships between Government, the domestic and international research community and the private sector in order to take advantage of the relative strengths of each and to better leverage outcomes.

One of the Australian Government's key initiatives is the establishment of the Global Carbon Capture and Storage Institute (GCCSI) for which Australia will contribute $100 million annually. This initiative is focused on accelerating development, diffusion and deployment of commercially and environmentally sustainable CCS technology. It will complement and leverage the work in existing international forums partnerships.

Membership of the GCCSI is open to all governments, industry and non-government organizations. A condition of engagement with GCCSI in a CCS project will be agreement that project development experience and operating data will be disseminated to the global CCS community. Exploration and mapping of potential storage sites will also be shared. The GCCSI will also seek to facilitate demonstration projects which could potentially be sited in developing countries.

Australia has also established the National Low Emission Coal Initiative (NLECI) which aims to ensure the coal sector makes a major contribution to greenhouse abatement while enhancing coal's contribution to energy security and economic well being. The national strategy will cover the research and development, accelerated demonstration and early commercial deployment of low emission coal technologies, including carbon capture and storage.

The NLECI will work in cooperation with the coal producers' COAL21 Fund as part of a world-first whole-of-industry funding approach to support greenhouse gas abatement. The COAL21 Fund will provide over $1 billion over 10 years from a voluntary levy on coal production to support the pre-commercial demonstration of low emissions technologies in the power generation sector (where over 95 per cent of emissions from coal occur) and supporting R&D.

In promoting partnerships, Australia supports the Asia-Pacific Partnership on Clean Development and Climate (APP) and has invested $100 million to support around 60 projects under this program. The program is focused on developing practical projects that involve a high level of cooperation between government, industry and researchers in and across developed and developing country partners in the Asia Pacific region. Projects cover bench-top R&D through to demonstration as well as information/capacity building.

Australia also continues to see benefits in engagement in international fora to develop cost effective technologies to address climate change: including Carbon Sequestration Leadership Forum (CSLF); International Partnership for the Hydrogen Economy (IPHE); Renewable Energy and Energy Efficiency Partnership (REEEP); Methane to Markets Partnership (M2M), and IEA R&D programs/implementing agreements, with Australia recently joining the IEA's Climate Technology Initiative (CTI). We believe they have proven to be highly effective mechanisms for bringing together governments, industry and research stakeholders across a wide range of countries and to identify potential issues and actions associated with specific technology development.

Under the recently announced Carbon Pollution Reduction Scheme, the Climate Change Action Fund will provide assistance to industry by addressing persistent market failures that impede the uptake of lower emission technologies and processes.

In July 2008, the Australian Government committed $46.2 million for a Climate Change Research Program (CCRP) which will support research with an emphasis on showing how it can be applied on the ground in agriculture, fisheries, forestry and food industries. It will encourage partnerships between research providers and farmers to put new technology to work on their properties. In February 2009, the Government announced a further investment of $11.3 million of CCRP funding in projects to reduce the greenhouse gas emissions from livestock. Further announcements of successful projects are expected over the coming months.

The Australian Government has also established the Renewable Energy Fund to accelerate the development and commercialisation of renewable energy technologies in Australia. Funding of $500 million is provided for a series of competitive grant programs that aim to demonstrate the viability of renewable energy technologies on a technical and economic basis.

Program elements include a $435 million Renewable Energy Demonstration Program, which is intended to bridge the gap between pilot scale testing and commercial uptake. This targets large-scale commercial demonstration, requiring technology proposals to be at an advanced stage of development, a $50 million Geothermal Drilling Program to support companies in the geothermal energy sector; and a $15 million Second Generation Biofuels Research and Development Program to support the research, development and pre-commercialisation of second generation biofuels. Australia would be pleased to share the experiences and information gained from these programs with other interested Parties.

(c) ***Review the mechanisms and processes developed to enhance cooperation with relevant intergovernmental processes.***

Promoting greater international collaboration is also critical to accelerating the development and global deployment of mitigation and adaptation related technologies. Given this, Australia places high priority on the development of bilateral and partnerships that support practical technology-based solutions to climate change.

In this regard, the Australian Government has provided $20 million for the Australia-China Joint Coordination Group on Clean Coal (JCG). The JCG was established to facilitate and enhance the development, application and transfer of low emissions coal technology between Australia and China. The JCG builds on existing bilateral and multilateral initiatives which support Australia-China cooperation on low emissions coal technology.

Australia is an active participant in a wide range of international technology partnerships, as well as in clean technology-related multilateral initiatives through its development assistance program. For example Australia's financial contributions to the Asian Development Bank-led Clean Energy Financing Partnership Facility supports the deployment of new technologies with strong demonstration effects and the lowering of barriers to new technologies in the Asia-Pacific region.

Australia acknowledges a wide variety of processes, mechanisms and organisations both inside and outside the UNFCCC – such as the International Energy Agency, Organisation for Economic Cooperation and Development (OECD), the United Nations Environment Programme (UNEP), Global Environment Facility (GEF), the multilateral development banks and various

national and international programs – have experience and expertise in implementing global technology cooperation. Institutions with specific technological expertise, such as the International Renewable Energy Agency (IRENA), can also play a valuable role.

In order to maximise the return on our resources, Parties should seek to use existing processes and mechanisms rather than create new ones.

(d) ***Review efforts to promote collaborative research and development on and deployment of technologies for mitigation and adaptation.***

Promoting research and development outcomes requires well developed national and international systems of innovation which support public and private sector investment, seek out the benefits of collaboration and which address the challenges of the technology development process. A clear feature of our efforts is promoting collaboration between business, research community and international partners and leveraging resources/sharing risks and benefits.

Australia's premier research agency, the CSIRO has in place a National Research Flagship program. The flagships are focused on building partnerships of leading Australian scientists, research institutions, commercial companies, and selected international groups. Currently, the program has six flagships, with each focusing on a challenge of the significant importance to Australia.

In particular, the CSIRO Climate Adaptation Flagship with a budget of $30 million in 2008-09, aims to equip Australia with adaptation options to climate change, and add $3 billion per year to the economy in 20 years time. The focus will be on coasts, natural ecosystems and primary industries - farming, forestry and fisheries. The Energy Transformed Flagship focuses on developing clean, affordable energy and transport technologies for a sustainable future.

The Australian Research Council (ARC) was established as an independent body under the *Australian Research Council Act 2001.* It advises the Government on research matters and manages the National Competitive Grants Program. The ARC *Linkage* programs help to broker partnerships between researchers and industry, government and community organisations as well as the international community. The international linking within the scheme provides two types of support:

- ARC International Fellowships are available for outstanding postdoctoral, research and senior research fellows to work in Australian or overseas organisations for periods of up to 12 months.
- Internationally Coordinated Initiatives funding is available from the ARC, in association with one or more research funding agencies overseas, to research partners in international collaborative projects.

Australia's Collaborative Research Centres (CRC) program is focused on linking private sector organisations (both large and small enterprises), industry associations, universities and government research agencies such as the CSIRO, and other end user to focus R&D efforts on progress towards utilisation and commercialisation. Industry also makes a strong contribution to CRC education programs to produce industry-ready graduates.

Leading Australia's climate change adaptation research effort is the National Climate Change Adaptation Research Facility, hosted by Griffith University. The Australian Government has provided $10 million over four years to establish research networks investigating the effects of climate change on areas such as water resources, human health, emergency services,

infrastructure and biodiversity. The facility will lead the Australian research community in a major national inter-disciplinary effort to generate the information decision makers need to manage the risks of climate change impacts.

Australia has also put in place national systems of energy innovation. For example, the Energy Innovation Fund has been established by the Australian Government to provide $150 million over four years to support the development of clean energy technologies. This includes the establishment of the Australian Solar Institute. The Institute will provide support research and development of solar photovoltaics and solar thermal technologies to help solar power become cost competitive with other energy sources. The Institute will support this innovation drive through greater collaboration between Australian and international researchers in solar energy technologies.

The Australian Government has also committed $50 million to establish the Geothermal Drilling Program and has signed a Geothermal Partnership with Iceland and the United States to cooperate in the development of this technology. The expertise gained in the exploration and proving of deep geothermal resources could be shared with developing countries. Opportunities for capacity building exercises with appropriate developing countries will be explored.

Australia also supports the longer-term development of new technical expertise in developing country partners through the extensive AusAID-led scholarship program, accounting for almost 5% of total ODA in 2007-2008. At any one time, there can be some 2,500 – 3,000 scholars in Australia. Environment and Climate Change studies are sectoral priorities for scholarships in several recipient countries including India, Indonesia and Papua New Guinea.

(e) ***Review the adequacy and timeliness of the financial support provided, within the context of Article 4, paragraphs 1(c) and 5, for the purposes of development and transfer of technologies, the related activities and their results*****.**

Australia notes the growing number of funding initiatives to support technology transfer. We also note the continued work of the Experts Group on Technology Transfer (EGTT) on performance indicators, and that this work will be complementary to this Review.

The Bali climate change meeting in December 2007 resulted in a commitment by Parties to increased and sustained levels of long term action on climate action, with technology cooperation being a key component of the Bali decisions. The World Bank's Climate Investment Funds are designed to provide a long term framework for scaling up investment in clean energy technologies. They are trialing governance models and approaches to disbursements that will generate lessons and experiences to feed into the UNFCCC negotiations. Australia supports this framework and has committed $150 million ($100 million to the Clean Technology Fund and $50 million to the Strategic Climate Fund). Australia has also contributed to the Least-Developed Countries Fund of the UNFCCC. Since 1991, Australia has contributed financially to the Global Environment Facility, which is the operating entity of the financial mechanism of the Convention. Australia also supports regional and global clean energy initiatives.

The Australia Government has committed $1.7 billion to support the research and development of clean energy technologies. This funding is additional to the up to $100 million per annum it has allocated for the GCCSI and the $100 million it has committed to the Asia Pacific Partnership on Clean Development and Climate.

Australia's $200 million *International Forest Carbon Initiative* supports international efforts to reduce emissions from deforestation and forest degradation in developing countries (REDD) and to show how REDD can be included in a post-2012 global agreement on climate change. Australia is providing substantial scientific, technical and analytical support for Indonesia's efforts to develop their own national carbon accounting and monitoring system. Australia is offering advice and assistance to Indonesia as they develop a blueprint on what the functions and performance characteristics should be for their system. Australia is also working with China on developing their new generation forest monitoring and carbon accounting on which excellent progress has been made.

Many countries have bilateral arrangements in place to support climate change activities in developing countries. For example, the Australian Government has a $150 million International Climate Change Adaptation Initiative (ICCAI) to meet high priority climate adaptation needs in vulnerable countries. Australia also supports an overseas development assistance (ODA) program that includes climate change as a focus area in a number of country programs, and supports a substantial scholarship program to support longer-term development of developing country expertise in areas such as climate change.

Australia notes that even though ODA and public funding have an important role to play, particularly in supporting least developed countries, there are limits to what public funding can realistically achieve and the challenge is to consider how best such funds can be utilized to leverage or enhance increased private investments. The UNFCCC's technical paper on Investment and Financial Flows to Address Climate Change suggests that the private sector is the principal financier of clean technologies, and there should be further work to identify what is needed to support the continued evolution of private sector funding.

Conclusion

The Review should take into account the various processes and measures outlined by Parties both inside – but predominantly outside – the formal framework of the UNFCCC. As is clear from this submission, much technology cooperation is already occurring globally. Australia looks forward to working closely with the Secretariat and consultants if appointed by the Secretariat.

PAPER NO. 2: BELARUS

Министерство природных ресурсов и охраны окружающей среды
Республики Беларусь

Сообщение по вопросам разработки и передачи технологий

в соответствии с документом FCCC/SBI/2008/L.28 Вспомогательного органа по осуществлению и параграфом 3 дополнения 1 в версии, исправленной на пленарной сессии КС

Введение

Республика Беларусь приветствует предложение Вспомогательного органа по осуществлению предоставить свои соображения по позициям относительно разработки и передачи технологий, изложенным в техническом задании на обзор и оценку эффективности исполнения параграфов 1 (c) и 5 статьи 4 РКИК ООН, и в соответствии с документом FCCC/SBI/2008/L.28. Вопрос укрепления потенциала стран в разработке, передаче и освоении эффективных технологий для противодействия изменениям климата очень важный и обмен мнениями в этой сфере является весьма актуальным.

Позиция по разработке и передаче технологий

Республика Беларусь считает необходимым информировать Вспомогательный орган по осуществлению, что страна выступила с инициативой проведения тематических слушаний по вопросам международного сотрудничества в энергетической сфере по следующим направлениям:

(a) Повышение энергоэффективности экономик;
(b) Энергосбережение;
(c) Повышение доступности передовых технологий;
(d) Использование возобновляемых источников энергии.

Слушания должны состояться 1 мая 2009 года в рамках Генеральной Ассамблеи ООН на ее 62-ой сессии. Республика Беларусь предлагает рассмотреть результаты этих слушаний по пункту (c) выше на одном из ближайших заседаний Вспомогательного органа по осуществлению.

Республика Беларусь представляет целесообразным рассмотреть возможность создания нового Вспомогательного органа РКИК ООН или расширить полномочия Экспертной группы по передаче технологий до уровня консультационного центра при Вспомогательных органах РКИК ООН по разработке и передаче технологий.

Республика Беларусь считает, что такой орган являлся бы часть эффективной системы разработки, передачи и распространения технологий, которая должна выполнять, по крайней мере, следующие функции:

- подготовку специальных обзоров о существующих технологиях, включая сведения о предполагаемых расходах, рисках, выгодах, ограничениях, а также о необходимой инфраструктуре, персонале, потенциале распространения и т.д.;
- оценку потребности принимающей стороны в данной технологии;
- оценку возможности адаптации каждой определенной технологии к условиям принимающей стороны;
- оценку риска и потенциальных негативных последствий распространения данной технологии в принимающей стороне;

- повышение потенциала принимающей стороны для эффективного размещения и использования данной технологии, что включает в себя также создание и поддержание необходимых инфраструктурных элементов;
- разработку предложений по реализации наиболее приемлемой схемы финансирования данной технологии в данной стране, включая оценку местных возможностей в производстве ее компонентов и обслуживании;
- разработку регулирующих документов, условий и критериев, руководящих принципов и подготовку соответствующих решений Сторон.

Республика Беларусь обращает особое внимание на то, что страны с переходной экономикой также нуждаются в привлечении инвестиционных ресурсов, обеспечении свободного доступа и освоении новых низкоуглеродных технологий. При этом, для многих из этих стран не требуется безвозмездное субсидирование мероприятий и программ по смягчению воздействия на климат. Здесь необходимо ориентироваться на инвестиции в виде долгосрочных займов, кредитования и программ двухстороннего сотрудничества в научно-технологической сфере.

Республика Беларусь отмечает, что при совершенствовании экономических механизмов гибкости, которое осуществляется в настоящее время в рамках деятельности Специальных рабочих групп РКИК ООН и Киотского протокола, необходимо учитывать их влияние и взаимосвязь с процессом разработки и передачи технологий.

[TRANSLATION AS SUBMITTED]

The Ministry of Natural Resources and Environmental Protection
of the Republic of Belarus

Submission on development and transfer of technologies (SBI)

in accordance with document FCCC/SBI/ 2008/L.28 of the Subsidiary Body for Implementation and Add.1 paragraph 3 as amended in COP plenary

Introduction

The Republic of Belarus welcomes the proposal of the Subsidiary Body for Implementation to provide its views on positions concerning development and transfer of technologies, described in the terms of reference for the review and assessment of the effectiveness of the implementation of Article 4, paragraphs 1 (c) and 5, of the UNFCCC and in accordance with document FCCC/SBI/2008/L.28. The issue of capacity-building of the countries in development, transfer and assimilation of effective technologies for combating climate change is very important and exchange of opinions in this field is of current interest.

Position in development and transfer of technologies

The Republic of Belarus considers being necessary to inform the Subsidiary Body for Implementation that the country has initiated the topical hearings on issues of international cooperation in energy sphere covering the following areas:

(e) Enhancement of energy efficiency of economies;
(f) Energy saving;
(g) Enhancement of accessibility to advanced technologies;
(h) Utilization of renewable energy sources.

The hearings are scheduled for May 1, 2009 in the framework of the UN General Assembly at its 62th Session. The Republic of Belarus suggests reviewing the results of these hearings concerning item (c) above at the nearest session of the Subsidiary Body for Implementation.

The Republic of Belarus considers being expedient to discuss possibility of establishing a new UNFCCC subsidiary body or expanding authorities of the Expert Group on Technology Transfer up to the level of the advisory center at UNFCCC subsidiary bodies for development and transfer of technologies.

The Republic of Belarus considers that such the body would be a part of effective system of development, transfer and deployment of technologies, which should perform at least the following functions:

- Development of special reviews on existing technologies, including information on estimated cost, risks, benefits, limitations and also required infrastructure, human resources, diffusion potential, etc.;
- Technology needs assessments for the host Party;
- Adaptation potential of a given technology in conditions of the host Party;
- Assessment of risk and potential negative consequences of deployment of a given technology for the host Party;
- Enhancement of the host Party potential in effective accommodation and utilization of a given technology what includes establishment and maintenance of required infrastructural elements;

- Elaboration of suggestions on implementation of the most appropriate financial scheme for a given technology deployment in a given country including assessment of local capability in production of its components and their servicing;
- Elaboration of regulatory documents, terms and criteria and guidance, and preparation of the respective decisions of the Parties.

The Republic of Belarus calls special attention to the fact that the countries with economy in transition also need in attracting investment resources, securing easy access to and assimilating new low-carbon technologies. At the same time, many of these countries do not require gratuitous subsiding of their climate change mitigation activities and programs. Here it is necessary to focus upon such investments as long-term loans, crediting and programs of bilateral cooperation in the field of science and technology.

The Republic of Belarus admits that while improving the flexible mechanisms implemented in the framework of Ad-hoc Working Groups of UNFCCC and the Kyoto Protocol, it is necessary to take into consideration their influence on and interrelation with a process of development and transfer of technologies.

PAPER NO. 3: BELIZE

Submission by Belize on the Effectiveness of Article 4, paragraph 1(c) and 5 of the Convention on the Development and Transfer of Technology

Introduction

The Fourteenth Conference of the Parties (COP 14) of the United Nations Framework Convention on Climate Change (UNFCCC) invited Parties and relevant organizations to make submissions to the UNFCCC Secretariat by 16 February 2009, in accordance with paragraph 9 of the Terms of Reference for the Review and Assessment of the Effectiveness of the Implementation of Article 4, paragraphs 1 (c) and 5 of the Convention as contained in the annex to document FCCC/SBI/2008/L.28.

The submissions should be based on the following five areas of focus.

Areas of Focus

(a) Review the extent to which actions have promoted and supported institutional systems and regulatory and legislative frameworks needed to scale up development and transfer of technologies.

The UNFCCC entered into force in 1992. It is estimated that it takes approximately ten years after a new technology has been developed and deployed for it to have any significant impact in a sector. In the 15 years since the Convention has come into force, global emissions of greenhouse gases have increased significantly. Therefore, it is difficult to see how any of the actions taken so far have scaled up the development and transfer of technology. If indeed institutional systems had been promoted and supported and regulatory and legislative frameworks had been adopted to promote the development and transfer of technology then the effects of such actions would have resulted in significant deployment of more energy efficient technologies in all sectors.

The ineffectiveness of such actions is even more evident for technologies for adaptation. The impacts of climate change are more evident with each passing day. If the actions taken were having any impact, then there would be less negative impacts.

(b) Review the range of practical actions taken and identify possible actions to promote innovative public and/or private partnerships and cooperation with the private sector and consider steps that governments, the business sector and academia can take to facilitate effective participation by the private sector.

Some innovative actions have been undertaken especially through the Climate technology Initiative (CTI) to develop mechanisms like the Private Financing Advisory Network (PFAN) which encourage private financial entities to develop and invest in technology transfer projects. However, these activities are occurring on a very limited basis and must be expanded significantly if they are to have any impact.

Many non-Annex I Parties have conducted their Technology Needs Assessments (TNAs) which contain concepts and project ideas to enhance the development and transfer of technologies within their countries. Mechanisms should be developed and implemented so that these can be circulated to the private sector and academia in both developed and developing countries to encourage partnerships to stimulate the development and transfer of technologies.

(c) Review the mechanisms and processes developed to enhance cooperation with relevant intergovernmental processes.

The intergovernmental processes that have promoted the development and transfer of technology include the United Nations Development Programme (UNDP) through the production of the TNA manuals, the Global Environmental Facility for the funding of projects to develop TNAs, and the United Nations Industrial Development Organization (UNIDO) through its organization of workshops on developing fundable technology transfer projects. While these initiatives are laudable, they have not made any significant impact on the wide scale implementation of technology transfer projects.

(d) Review efforts to promote collaborative research and development on and deployment of technologies for mitigation and adaptation.

Efforts in this area have been very limited especially in the Caribbean. While there may have been or there is interest for such initiatives in both developed and developing countries there is no process to facilitate the exchange of interest. Such a mechanism must be developed.

(e) Review the adequacy and timeliness of the financial support provided, within the context of Article 4, paragraphs 1(c) and 5, for the purposes of development and transfer of technologies, the related activities and their results.

To date funding has been provided to developing countries to prepare their TNAs through a “top-up” facility of the GEF. Those Parties which did not access that facility were given another opportunity to do so while preparing their project proposals for their Second National Communications. A new revised manual on preparation of TNAs is being prepared by the UNDP. Funding may become available to enable developing countries to update or prepare their TNAs using these new methodologies.

Funding for activities for concrete activities for the development and transfer of technologies is limited. The only funding that has been provided so far is that provided for mitigation projects funded by the GEF. There has been even less for adaptation projects. There must be significantly more financial support provided to support the development and transfer of technology.

PAPER NO. 4: CANADA

[ENGLISH AND FRENCH]

SUBMISSION BY CANADA TO THE UNFCCC REVIEW OF TECHNOLOGY COMMITMENTS UNDER THE CONVENTION (ARTICLES 4.1C AND 4.5)

The Convention sets out commitments for *all Parties* to advance the development and diffusion of environmentally sound technologies that will contribute to addressing the challenge of climate change. In Canada's view, meeting these commitments require both domestic and international technology actions. This submission summarizes key examples of Canada's experiences in the development, deployment and transfer of climate-friendly technologies, across the technology spectrum from R&D to commercialization, which provide models of best practices that could be adapted to suit the national circumstances of other countries.

Section I focuses on the domestic technology development context. Section II highlights key intergovernmental mechanisms that Canada has employed to advance international technology collaborations for climate-friendly technology. Section III summarizes key lessons learned from Canada's technology experiences that could form constructive inputs to the review, and that could contribute to improvements in global technology development and deployment of technologies for mitigation and adaptation.

I. CANADA'S DOMESTIC TECHNOLOGY DEVELOPMENT & DEPLOYMENT EXPERIENCE

Building an Endogenous Technology System

A critical success factor in advancing Canada's climate-related technology objectives is a solid endogenous technology system. Canada has taken several measures to establish and strengthen a domestic technology system that combines institution-building, skills development, and collaborative partnership models. Examples include:

- Canada's National Science and Technology Strategy, which provides a framework to guide government policy and program decision-making, and clearly articulates national-level S&T priorities to key stakeholders, including the private sector. The Strategy's focus on environmental and energy technologies, among other policy priorities, ensures that climate-friendly technologies are key priorities for Government of Canada investments in technology development processes.

- The National Research Council is Canada's premier organization for research and development. The NRC is made up of 20 research institutes and programs that span a wide variety of disciplines. Many of NRC's institutes work collaboratively with other stakeholders (including companies, research organizations, universities, and government agencies), to advance energy and climate-related technologies. One such institute is the Institute for Fuel Cell Innovation (IFCI).

- The Canada Research Chairs Program (CRC) lays the groundwork for critical early stage technology research and development activities and long-term skills development for Canadian researchers. Through Canada's Industry portfolio, the CRC's goal is to attract and retain top researchers to Canadian universities. R&D activities linked to climate-friendly technologies supported by CRC include research in the areas of fuel cells, clean energy systems, and material and environmental chemistry.

- Canmet ENERGY, a network of federal labs across Canada, is one of the main vehicles for energy R&D activities in the Federal Government. Working in partnership with other federal and provincial partners, academia and private industry across Canada, Canmet ENERGY develops and delivers knowledge and technology-based programs for the sustainable production and use of Canada's energy.

- Federal- Provincial Partnerships and initiatives at the Provincial level have made advancements in the area of carbon capture and storage (CCS) technology. For instance, the Federal Government has partnered with the province of Saskatchewan and invested $240 million for SaskPower to rebuild an existing coal-fired electricity generation unit, equipped with CCS, at its Boundary Dam facility. In July 2008, Alberta committed $2 billion to support three to five large scale CCS projects in the province.

Targeted Research and Development Investments

To leverage the multitude of private sector R&D activities, the Government of Canada makes targeted R&D investments. Such investments are geared to support public-private collaboration and development of networks among key technology stakeholders. Strategic R&D investments also address financing gaps where there is little incentive for private sector participation (e.g. early-stage R&D). Examples of Government of Canada support for climate-related R&D include:

- Over CDN$1 billion committed to accelerate the development and market readiness of clean energy technologies, including clean coal and carbon capture and storage (CCS). Public-private collaboration supported by government seed funding will work to increase clean energy supplies, reduce energy waste, and reduce pollution from energy sources in areas ranging from cleaner fossil fuels to next-generation nuclear technology to bio-based energy systems.

- The Program for Energy and Research and Development (PERD) is a federal interdepartmental program that funds R&D related to the supply and use of energy. PERD facilitates a collaborative approach to R&D, as its funds are allocated to relevant government departments and agencies which then partner with appropriate technology stakeholders, including federal laboratories, the private sector, academic institutions, provincial and municipal governments, research organisations, and international organizations.

Technology Partnership Models

In order to reap the rewards of R&D, the Government of Canada's efforts have focused on bridging the gap between the development, deployment and commercialization of technology through valuable partnerships. Examples of our continued success include:

- Provision of over CDN $1 billion in public funding to Sustainable Development Technology Canada (SDTC) for technology demonstration and to build the capacity of Canadian clean-technology entrepreneurs by helping them form strategic relationships, formalize their business plans and build a critical mass of sustainable development capability in Canada. Results to date include allocation of a total of $342 million to 144 projects, while leveraging an additional $800 million from other project partners. One of the strongest contributing factors to the success of SDTC is that it works closely with the private sector to identify and assess investment risks and develop tailored financing packages that will allow private sector entities to successfully manage the risk over the length of their investment. STDC also strongly promotes partnerships along the entire supply chain, from researchers to manufacturers, retailers and end customers.

- Assistance to small and medium sized enterprises to commercialize innovative environmental technologies through the Canadian Environmental Technology Advancement Centres. These

Centres provide a wide range of services tailored to client needs, including assistance with accessing funding sources and investment capital, general business development counselling, technical services and market analysis. Since they began operations in 1994, the CETACs have played a pivotal role in the successful deployment of hundreds of environmental technologies and have effectively promoted the adoption of sustainable development and pollution prevention practices in several key industry sectors

- The Networks of Centres of Excellence programs, run jointly by Canada's scientific granting agencies[1], work to mobilize research and commercialization in key areas by bringing together partners from academic, industry, public and non-profit sectors to conduct leading edge research and knowledge transfer in areas of strategic growth and opportunity for Canada. Successful enabling activities undertaken by the programs include:
    - running peer-reviewed funding competitions on a cyclical basis.
    - setting clear targets and goals, monitoring progress and achievement of funded organization.
    - maintaining close relations with existing and potential partners in academia, industry, public and non-profit sectors.

- The Canadian Model Forest Network (CMFN), a network of 14 model forest sites across Canada. Each local site involves numerous partners who all work towards sustainable landscape management. Partners include, forest companies, Aboriginal communities, private citizens, parks, environmental groups, governments and universities. The CMFN is taking steps to learn how forest management activities can affect climate change and contribute to the reduction of carbon in the atmosphere, as well as how forest-based communities can adapt to climate change. Key activities include cutting-edge research, innovative education initiatives and practical, hands-on workshops that aid in forest management planning and community development.

Tools for Technology Development and Deployment

Governments can also make strong contributions to the technology development and deployment processes by the use of specific tools that can support and enable informed decision-making by the appropriate stakeholders, from researchers to private investors to end-use consumers. The following are examples of such tools employed in the Canadian context:

- Design of collaborative groups that bring the relevant stakeholders together to identify key issues that need to be addressed to accelerate the deployment of technologies, for example the Carbon Capture and Storage (CCS) Task Force, initiated jointly by the Government of Canada and the province of Alberta, that includes collaboration with key industry partners.

- Technology roadmaps developed for wind, CCS and clean coal (and forthcoming for plug-in hybrid vehicles) in consultation with key stakeholders including industry, academia and provincial governments. A critical success factor in technology road-mapping is ensuring alignment of technology needs and priorities. The objective is to develop a critical path that identifies necessary partnerships, collaborative activities, and financing required over the long-term to advance a particular technology through to the deployment and diffusion phases.

- The Light Detection and Ranging (LIDAR) technology, a private sector technology, creates high resolution digital topographical maps. The Government of Canada has contracted the use of this

[1] Canada's main Federal scientific granting agencies include CIHR (Canadian Institute of Health Research)), NSERC (Natural Sciences and Engineering Research Council of Canada), and SSHRC (Social Sciences and Humanities Research Council of Canada)

technology to obtain detailed information on the potential for coastal flooding and erosion, key for addressing adaptation to climate change.

Deployment and Diffusion of Climate-friendly Technologies: Regulatory Measures and Incentives

Once climate-friendly technologies have successfully moved from the laboratory to the market, targeted policy measures such as regulations and direct financial incentives can encourage the use of existing technologies and result in tangible reductions in energy consumption and GHG emissions. Examples in the Canadian context include the following:

- Recently strengthened regulations under the Energy Efficiency Act, set minimum energy-performance standards for a number of energy-using products such as appliances, lighting, and heating and air-conditioning products, as well as products that use standby power[2] as energy-using products (e.g. televisions, computer printers and compact-audio products). By providing clear signals to the private sector, these regulations can facilitate the trade of climate-friendly products and have the potential to create an industry shift towards the development, deployment and commercialization of more energy-efficient technologies.

- To complement this regulatory package, the Government of Canada has announced a suite of ecoENERGY Initiatives designed to help boost clean energy supplies, help Canadians use energy more efficiently and develop clean energy technologies. One component, the ecoENERGY Efficiency Initiative, invests approximately $300 million in targeted programs that promote smarter energy use across all sectors of society. This initiative fills the gaps where the Government can not regulate and encourages energy-efficiency action by Canadians, businesses and industries.

- Consumer awareness programs such as EnerGuide, an initiative which provides consumers with information about a product's energy consumption, and ENERGY STAR, a dynamic government/industry partnership that helps consumers identify the most energy efficient products.

- An energy efficiency retrofit program provides grants to Canadian households upon completion of residential energy efficiency upgrades, critical in our national circumstances where temperatures vary from -35 °C to +35 °C. To date, 50,000 homeowners have received such rebates.

- A renewable energy production incentive (CDN$0.01/kWh) is offered to qualifying projects over 10 years that will support the deployment of renewable power technologies. This program has already committed support for 32 projects.

- Investments of up to CDN $1.5 billion over 9 years will boost production of biofuels in Canada by providing operating incentives to producers of renewable alternatives to gasoline and diesel.

- A Green Infrastructure Fund will provide CDN $1 billion to targeted investments, such as modern energy transmission grids, that enable investments by other stakeholders in the deployment of sustainable energy.

[2] Standby power refers to the lowest level of electricity consumed by appliances, which cannot be switched off (influenced) by the user, and may persist for an indefinite time when an appliance is connected the main electricity supply.

II. INTERNATIONAL COLLABORATION

Canada makes use of several international mechanisms to enhance intergovernmental collaboration on technology development and deployment, as well as to assist developing countries. In Canada's view, it is important to draw on existing mechanisms and approaches both within and outside the UNFCC in order to maintain coherent momentum on activities to enhance the development, deployment and transfer of climate-friendly technologies.

Technology Cooperation within the UNFCCC

The UNFCCC provides a strong platform to encourage greater collaboration amongst Parties in technology development and deployment. The Expert Group on Technology Transfer brings together national level expertise within the UNFCCC that provides guidance to Parties on issues regarding the development and transfer of environmentally sound technologies while respecting Parties' rights and obligations to determine, implement and execute technology strategies appropriate to their specific circumstances. Among its various deliverables, the *Guidebook on preparing technology transfer projects for financing* has provided a practical tool to project practitioners, and facilitated links between technology projects and private financing sources allowing these projects to move ahead.

Technology Needs Assessments (TNAs) are an important tool within the UNFCCC that have been used by developing countries to identify and prioritize technology needs at a national level. In collaboration with key partners (UNEP, UNDP), the EGTT's work on the update to the *Handbook for Conducting TNAs for Climate Change*, will provide a useful tool for stakeholders involved in undertaking technology needs assessments.

Much analytical work has been undertaken by UNEP and UNDP to identify best practices and challenges encountered in the TNA process which should be drawn upon in the process of this review. It is critical that TNAs do not become an end-product, but rather guide the implementation of a country's technology priorities. TNAs serve not only to define needs, but also to provide a platform for engaging the relevant stakeholders, domestically and externally, such as various levels of government and the financial community, to identify strategic partnerships early in the project development process.

Canada looks forward to the implementation of the Global Environment Facility's (GEF) Poznan Strategic Program for Technology Transfer that will seek to provide the next step for implementation of TNA results. This program will be funded in part from the technology portion of the Special Climate Change Fund (SCCF) under the UNFCCC, for which Canada is one of the largest donors. Notwithstanding the relative infancy of the Poznan Strategic Program for Technology Transfer, the approach undertaken by the GEF to design this program is noteworthy as significant consideration was given to identifying and addressing the strengths and gaps in the GEF's technology experience and using this analysis to build on existing activities.

Implementation of the Poznan Strategic Program for Technology Transfer should seek to leverage synergies with existing initiatives. The project development services provided by the Private Financing Advisory Network (PFAN), set up under the International Energy Agency's Climate Technology Initiative (CTI) to support the EGTT work on financing, enables project proponents to raise the calibre of project proposals to meet the standards of the international financing community. While highly successful in its current scope, the potential impact of this project could be significantly and positively enhanced if scaled-up.

Innovative financing has been an important element of the EGTT's work. In 2004, as EGTT Chair, Canada hosted the first UNFCCC workshop that dealt with climate change financing issues. A unique

element of this workshop was the representation of private sector views, which added a valuable dimension to the discussions. Key findings of this workshop included:

- Transparency that allows risk to be measured and managed is paramount to attracting investment for technology activities.
- Partnerships at all levels are vital to successful projects in developing countries. In particular, local partnerships are essential, including those between national and sub-national governments, investors, donors, non-governmental organizations, service providers, entrepreneurs and end-users. "Parachute" projects, which do not have local engagement, are unlikely to survive in the long-term.
- Financing for technology is not a "bolt-on" element to be secured in the final stages of project development, but rather must be embedded early on to ensure financing partners and project success. Roadmaps and TNAs can help identify this need.
- Capacity-building for project development is needed to attract investment financing, and essential for removing barriers to the mobilization of domestic capital for foreign direct investment.
- Clear definition and protection of intellectual property rights is necessary to attract private sector investment capital in any country.
- Project building can increase the attractiveness of a proposal.

Technologies for adaptation is an area where the EGTT has also made a solid contribution through a technical paper, as well as various workshops that assembled both technology and adaptation experts to examine the issues associated with technologies for adaptation. Outcomes from the EGTT's analytical undertakings in this area point to the opportunities to enable greater south-south collaboration, in addition to south-north partnerships, on technologies for adaptation, particularly where there are opportunities for knowledge-sharing and replication of technology experiences. This body of work is a productive input into the Nairobi Work Program on Impacts, Vulnerability, and Adaptation to Climate Change (NWP). As work evolves, synergies between the EGTT and NWP should continue to be explored to advance action in this important area.

Multilateral Mechanisms

In addition to the technology activities under the UNFCCC, there are a plethora of multilateral mechanisms that have resulted in the global advancement of climate-friendly technologies:

- Canada participates in several international technology partnerships, including being party to over 30 IEA Implementing Agreements which form the framework for facilitating initiation, implementation, monitoring and review of collaborative R&D between developed countries and emerging developing countries in renewable energy, energy end use, fossil fuels, information centers and modeling, and nuclear fusion.

- Canada is also member to several international technology partnerships, including:
    - The Carbon Sequestration Leadership Forum (CSLF), an international climate change initiative focused on the development of improved cost-effective technologies for the separation and capture of carbon dioxide for its transport and long-term safe storage.
    - The Methane to Markets (M2M) Partnership advances cost-effective, near-term methane recovery and use as a clean energy source. The Partnership acts as a mechanism to bring together parties from governments and the private sector to facilitate methane project development and implementation around the world.
    - The Renewable Energy & Energy Efficiency Partnership's (REEEP) works to accelerate the global market for sustainable energy by acting as an international and regional enabler, multiplier and catalyst to change and develop sustainable energy systems. REEEP works with governments, businesses, industry, financiers and civil society across

the world to expand the global market for renewable energy and energy efficiency technologies.
  - The International Partnership for the Hydrogen Economy (IPHE) is a coordinating forum aimed at accelerating transition to hydrogen economy.

- As a member of the Asia Pacific Partnership for Clean Development and Climate (APP), Canada places value on the unique approach of emphasizing practical actions in cooperation with the private sector. Given the private sector access to the magnitude of investment and innovation sources required to deploy technology, it is vital for governments to involve the private sector to leverage the scale of financing needed.

- Canada actively engages on energy science and technology partnerships with the United States and Mexico under the auspices of the North American Energy Working Group (NAEWG). The goals of the NAEWG are to foster communication and cooperation among the governments and energy sectors of the three countries on energy-related matters of common interest. There are now nine working groups under the NAEWG, on topics including oil sands, energy efficiency and science and technology.

- The G8 has also contributed significantly to enhancing international technology development, particularly through its ability to mobilize the appropriate international partners to address identified gaps. Highlights of the G8's climate change efforts in recent years include:

  - Development of energy efficiency recommendations by the International Energy Agency (IEA) which has resulted in the launching of the International Partnership on Energy Efficiency and Cooperation (IPEEC).
  - Examination of near-term opportunities for Carbon Capture and Storage (CCS) technologies by the IEA and Carbon Sequestration Leadership Forum (CSLF). Canada was pleased to host the final of three workshops in November 2007 that resulted in development of key recommendations to the G8 to advance the development and deployment of CCS technologies. Work continues in partnership between the IEA and CSLF to advance global implementation of these recommendations. The final report for this work will be submitted at the 2010 G8 Summit.
  - Development of technology roadmaps for key technologies, as well as giving continued momentum to advance the work on CCS initiated in 2005. The IEA will report back on progress in advancing the CCS recommendations in 2010 when Canada will host the G8 Summit.
  - Development of a framework for energy investment by the World Bank and Regional Development Banks, to accelerate the adoption of technologies which enable cleaner, more efficient energy production and use. This has culminated in the development of the World Bank's portfolio of Climate Investment Funds.

- Canada hosts the International Model Forest Network Secretariat which supports a global voluntary network of model forests representing major forest ecosystems. The network's goal is to advance sustainable management of natural resources and forested landscapes through Model Forests. The IMFN fosters information exchange, as well as international cooperation in critical aspects of forest science and social science that underlie the search for new models of forest management.

Bilateral Initiatives

The Government of Canada has taken steps to assist developing countries directly with their technology needs. For example, the Canadian International Development Agency has undertaken bilateral activities

which have included technology transfer projects for climate change development with a capacity-building approach to help developing countries reduce their emissions of greenhouse gases (GHGs) and contribute to sustainable development. While much success was achieved through these bilateral projects, key challenges in supporting endogenous technology development in developing countries were identified. These included the necessity of a long-term approach to support technology activities, greater attention to the appropriateness of technology selection, and the identification of technology needs by the recipient country.

Canada continues to support assistance to developing countries to address climate change, as demonstrated by the October 2008 CDN $100 million pledge to international climate change adaptation to assist those countries that are especially vulnerable to the adverse effects of climate change, such as least developed countries and small island developing states, particularly in Africa, the Caribbean, and the South Pacific.

Canada's International Development and Research Centre (IDRC) jointly funds the Climate Change Adaptation in Africa (CCAA) program with the United Kingdom's Department for International Development (DFID). The CCAA program works to establish a self-sustained skilled body of expertise in Africa to enhance the ability of African countries to adapt to the adverse effects of climate change. The goal of this program is to ensure that research institutions are better able to assess climate-related vulnerability and develop adaptation options.

The RETScreen Clean Energy Project Analysis Software is a decision-support and capacity-building tool developed by the Government of Canada that allows users worldwide to evaluate various feasibility factors associated with renewable energy project development (e.g. cost, emission reductions, financial viability etc). Available on the internet in 22 languages, the RETScreen tool has facilitated over 1000 MW of energy projects outside Canada, including hydro projects in Brazil, the Czech Republic, Guatemala, and Nicaragua, as well as photovoltaic projects in Costa Rica, Mauritania, and Senegal. Further to past efforts, more than 40 new workshops for renewable energy, energy efficiency and cogeneration have been scheduled across Canada and around the world (from Calgary Canada, to Manila, Philippines and from Thurles, Ireland to Brazzaville, Republic of Congo). In addition, a RETScreen Clean Energy Project Analysis Course has been created for use by educational centres and training organisations around the globe. 166 colleges and universities worldwide now use RETScreen for training and more than 25,000 people visit the RETScreen website each week to access this information.

Canada also makes use of other bilateral avenues to advance international collaboration. Canada has signed bilateral S&T agreements with several partner countries, including China, the EU, France, Germany, India, Israel, Japan, and Korea. These agreements serve as the guidelines for business and government to effectively work with partner countries to increase international science and technology capacity.

III. PROPOSED REVIEW RECOMMENDATIONS

This survey of Canada's domestic and international climate-related technology activities captures many models for collaborative technology activities that could provide valuable best practices for other countries to adapt to national circumstances. The following guiding principles could greatly inform the recommendations produced from the review of technology commitments under the UNFCCC:

- Enabling environments are a critical element required for successful and long-term technology development and deployment. Domestic regulatory and policy frameworks should provide clear signals and appropriate incentives to the relevant stakeholders involved in the technology process, including the private sector.

- Given the magnitude of the investment need required, the involvement of the private sector in technology development and deployment is paramount, and approaches should be explored that engage and leverage the participation of the private sector. Such approaches could include innovative public-private partnerships, as well as developing risk assessment and management tools that will support private sector investments during the critical financing stages of technology development and deployment.

- Efforts to create and maintain an institutional capacity for research and development, particularly during early-stage activities are important. In addition to yielding direct technology benefits, such capacity can provide the basis for partnerships among technology stakeholders to thrive and evolve over time.

- Successful technology transfer initiatives are likely to be those that are guided by approaches that ensure the sustainable integration of technologies in recipient countries over the long-term. Useful tools include those that assist with self-identification of technology priorities, facilitate investment "matchmaking," identify and remove key barriers, promote education and awareness and support partnership opportunities between relevant stakeholders over the long-term.

- A wealth of international climate-technology activities is underway both inside and outside the UNFCCC. The development of international strategies to advance climate-friendly technology development and deployment should focus on identifying existing strengths and weaknesses of current institutions, and seek to address gaps, exploit synergies, build momentum, and avoid competition and overlap among existing structures.

- To further engage the private sector in financing work, international activities could focus on identifying new avenues to incorporate the valuable perspective of private sector representatives as true partners in the effort to advance and accelerate work internationally. A potential improvement to the EGTT could be the development of a Private Sector Advisory Group or the establishment of a partnership with a private sector association such as the World Business Council on Sustainable Development.

- The development of practical tools to support assessment and decision-making processes, such as the Technology Needs Assessment tool and the EGTT's Project Proposal Handbook, can provide significant assistance to technology project proponents in developing countries. Efforts should continue to identify and develop the types of analytical and practical tools to support technology decision-makers.

- Country-driven technology needs assessments are crucial for developing countries seeking technology support. Priorities should be identified in consultation with stakeholders and mainstreamed as a priority within broader government policies.

Ottawa, Canada
March 2009

[ANGLAIS ET FRANÇAIS]

PRÉSENTATION PAR LE CANADA AUX FINS DE L'EXAMEN DES ENGAGEMENTS EN MATIÈRE DE TECHNOLOGIE PRÉVUS AUX ARTICLES 4.1C ET 4.5 DE LA CCNUCC

La Convention-cadre des Nations Unies sur les changements climatiques (CCNUCC) prévoit que *toutes les parties* doivent s'engager à faire progresser le développement et la diffusion de technologies écologiquement rationnelles (écotechnologies) qui aideront à relever le défi du changement climatique. Selon le Canada, le respect de ces engagements nécessite des mesures technologiques nationales et internationales. La présentation donne en résumé des exemples clés d'expériences canadiennes du développement, du déploiement et du transfert des écotechnologies tout au long de leur chaîne de production – de la recherche-développement (R-D) à la commercialisation. Ces exemples constituent des pratiques exemplaires qui pourraient être adaptées à la situation d'autres pays.

La première section présente le contexte national du développement de technologies. La deuxième section met en lumière les mécanismes intergouvernementaux clés que le Canada a utilisés pour faire progresser la collaboration internationale dans le domaine des écotechnologies. La troisième section résume les principales leçons que le Canada a tirées de son expérience technologique et qui pourraient contribuer de façon constructive à l'examen et à l'amélioration des activités mondiales de développement et de déploiement de technologies aux fins de l'atténuation et de l'adaptation.

I. EXPÉRIENCE CANADIENNE DU DÉVELOPPEMENT ET DU DÉPLOIEMENT DE TECHNOLOGIES

Créer un système technologique national

La mise en place d'un solide système technologique national est un facteur crucial de l'atteinte, par le Canada, des objectifs liés aux technologies climatiques. Le Canada a pris plusieurs mesures pour mettre en place et solidifier un système technologique national basé sur le renforcement institutionnel, l'acquisition de compétences et le partenariat de collaboration. Voici des exemples de ces mesures.

- La stratégie nationale de sciences et de technologie du Canada constitue un cadre pour orienter le processus décisionnel sur la politique et les programmes du gouvernement, ainsi que pour formuler clairement les priorités nationales en matière de sciences et de technologie (S-T) à l'intention des principaux intervenants, notamment le secteur privé. Comme les technologies environnementales et énergétiques comptent parmi les priorités énoncées dans la stratégie, les investissements du gouvernement du Canada dans le développement de technologies ciblent en priorité les écotechnologies.

- Le Conseil national de recherches du Canada (CNRC) est le principal organisme de R-D du Canada. Il est composé de 20 instituts et programmes de recherche qui touchent une vaste gamme de disciplines. Un grand nombre des instituts du CNRC collaborent avec d'autres intervenants (notamment des entreprises, des organismes de recherche, des universités et des organismes gouvernementaux), afin de faire progresser les technologies énergétiques et climatiques. Mentionnons par exemple l'Institut d'innovation sur les piles à combustible (IIPC).

- Le Programme des chaires de recherche du Canada (PCRC) jette les fondements des activités cruciales des premières étapes de la R-D technologique et de l'acquisition de compétences à long terme par les chercheurs canadiens. L'objectif du PCRC est d'attirer et de garder les meilleurs chercheurs dans les universités canadiennes, par le biais du portefeuille canadien sur l'industrie. Les activités de R-D sur les écotechnologies qui sont financées par le PCRC portent notamment

sur les domaines suivants : piles à combustible, systèmes d'énergie propre et chimie des matériaux et de l'environnement.

- CanmetÉNERGIE - un réseau de laboratoires fédéraux de l'ensemble du Canada - est l'un des principaux centres d'activités de R-D énergétique au gouvernement fédéral. En collaboration avec des partenaires fédéraux et provinciaux, des universités et des entreprises de l'ensemble du Canada, il élabore et exécute des programmes axés sur les connaissances et la technologie qui visent à favoriser la production et la consommation durable d'énergie au Canada.

- Les partenariats fédéraux-provinciaux et les initiatives provinciales ont permis de faire progresser la technologie du captage et du stockage du carbone (CSC). Ainsi, le gouvernement fédéral a établi un partenariat avec le gouvernement de la Saskatchewan et investi 240 millions de dollars pour aider SaskPower à reconstruire une centrale d'électricité alimentée au charbon et équipée de la technologie du CSC au barrage Boundary. En juillet 2008, le gouvernement de l'Alberta a promis 2 milliards de dollars pour financer de trois à cinq projets de CSC à grande échelle qui seraient réalisés dans la province.

Investissements ciblés dans la R-D

Pour tirer parti de la multitude des activités de R-D du secteur privé, le gouvernement du Canada fait des investissements ciblés dans la R-D. Ces investissements visent à favoriser la collaboration entre le secteur public et le secteur privé et le réseautage entre les principaux intervenants du domaine technologique. Ils visent aussi à combler l'insuffisance du financement lorsque le secteur privé est peu enclin à participer (p. ex. aux premières étapes de la R-D). Voici des exemples de l'aide fournie par le gouvernement du Canada aux fins de la R-D climatique.

- Le gouvernement du Canada a investi plus de un milliard de dollars canadiens pour accélérer le développement et la commercialisation de technologies d'énergie propre, notamment celles du charbon propre et du CSC. Les projets réalisés en collaboration par le secteur public et le secteur privé qui ont reçu des fonds de démarrage de la part du gouvernement augmenteront l'offre d'énergie propre et réduiront le gaspillage d'énergie et la pollution attribuable aux sources d'énergie grâce notamment à des combustibles fossiles plus propres, à la technologie nucléaire de la prochaine génération et aux systèmes bioénergétiques.

- Le Programme de recherche et de développement énergétiques (PRDE) – un programme fédéral interministériel – finance les activités de R-D liées à l'offre et à la consommation d'énergie. Il favorise la R-D en collaboration et attribue des fonds aux ministères et organismes gouvernementaux pertinents, qui peuvent ensuite établir un partenariat avec des intervenants appropriés, notamment des laboratoires fédéraux, le secteur privé, des universités, des gouvernements provinciaux, des administrations municipales, des organismes de recherche et des organisations internationales.

Modèles de partenariat technologique

Pour tirer parti des activités de R-D, le gouvernement du Canada a ciblé ses efforts sur la réduction de l'écart entre le développement, le déploiement et la commercialisation des technologies grâce à de précieux partenariats. Voici des exemples qui confirment sa réussite à cet égard.

- Le gouvernement du Canada a attribué des fonds publics d'une valeur de plus de un milliard de dollars canadiens à Technologies du développement durable Canada (TDDC) pour faire des démonstrations de technologies et créer une capacité chez les fabricants canadiens de technologies propres en les aidant à établir des relations stratégiques, à officialiser leur plan d'affaires et à constituer au Canada une masse critique de capacités en développement durable.

Jusqu'à maintenant, il a attribué 342 millions de dollars à 144 projets et obtenu un montant supplémentaire de 800 millions de dollars auprès d'autres partenaires des projets. L'un des principaux facteurs du succès de TDDC est sa collaboration étroite avec le secteur privé en vue de déterminer et d'évaluer les risques d'investissement et d'élaborer des mesures de financement adaptées qui permettront aux entreprises de gérer le risque avec succès pendant toute la durée de leur investissement. En outre, TDDC encourage fortement l'établissement de partenariats tout au long de la chaîne d'approvisionnement, des chercheurs aux fabricants, aux détaillants et aux consommateurs.

- Le gouvernement du Canada aide les petites et moyennes entreprises à commercialiser des technologies environnementales innovatrices par le biais des Centres canadiens pour l'avancement des technologies environnementales (CCATE). Ces centres offrent une vaste gamme de services adaptés aux besoins des clients, notamment de l'aide pour avoir accès à du financement et à des capitaux d'investissement, des conseils généraux sur le développement de l'entreprise, des services techniques et des analyses de marché. Comme ils ont été lancés en 1994, ils ont joué un rôle clé dans le déploiement réussi de centaines de technologies environnementales et favorisé l'adoption de pratiques de développement durable et de prévention de la pollution dans plusieurs secteurs industriels clés.

- Le Programme des Réseaux de centres d'excellence (RCE) – exécuté conjointement par les organismes scientifiques subventionnaires du Canada[1] - vise à mobiliser le talent en recherche et en commercialisation dans des domaines clés en réunissant des partenaires du milieu universitaire, de l'industrie, du secteur public et du secteur sans but lucratif, afin de mener de la recherche de pointe et des activités de transfert des connaissances dans des domaines d'importance stratégique en croissance et prometteurs pour le Canada. Voici les activités d'appui qui ont été entreprises dans le cadre du programme et qui ont porté fruit :
    - l'organisation régulière de concours comportant un examen par des pairs;
    - l'établissement d'objectifs et de buts clairs et la surveillance de la progression et des réalisations de l'organisation financée;
    - le maintien de relations étroites avec des partenaires actuels et éventuels du milieu universitaire, de l'industrie, du secteur public et du secteur sans but lucratif.

- Le Réseau canadien de forêts modèles (RCFM) compte 14 forêts modèles dans l'ensemble du Canada. De nombreux partenaires, qui travaillent tous en faveur de l'aménagement forestier durable, sont associés à chaque site local. Il s'agit notamment d'entreprises forestières, de collectivités autochtones, de citoyens, de parcs, de groupes de protection de l'environnement, de gouvernements et d'universités. Le RCFM tente de découvrir l'effet des activités d'aménagement forestier sur le changement climatique et la réduction du carbone dans l'atmosphère et cherche comment les communautés forestières peuvent s'adapter aux changements climatiques. Au nombre de ses activités, mentionnons la recherche de pointe, les initiatives éducatives innovatrices et des ateliers pratiques qui contribuent à la planification de l'aménagement forestier et au développement des collectivités.

Outils pour le développement et le déploiement de technologies

Les gouvernements peuvent aussi contribuer considérablement aux processus de développement et de déploiement de technologies en ayant recours à des outils spécifiques qui peuvent appuyer et favoriser

[1] Les principaux organismes scientifiques subventionnaires du Canada sont les Instituts de recherche en santé du Canada (IRSC), le Conseil de recherches en sciences naturelles et en génie du Canada (CRSNG) et le Conseil de recherches en sciences humaines du Canada (CRSH).

une prise de décisions éclairées par les intervenants pertinents - des chercheurs aux investisseurs privés et aux consommateurs. Voici des exemples d'outils utilisés dans le contexte canadien.

- Les groupes de collaboration réunissent des intervenants pertinents pour la détermination des questions clés qu'il faut régler afin d'accélérer le déploiement des technologies, par exemple le Groupe de travail sur le captage et le stockage du carbone, formé conjointement par le gouvernement du Canada et le gouvernement de l'Alberta, qui collabore avec des partenaires industriels clés.

- Les feuilles de route technologiques pour l'énergie éolienne, le CSC et le charbon propre (ainsi que pour les prochains véhicules hybrides rechargeables) sont élaborées en collaboration avec des intervenants clés, notamment l'industrie, le milieu universitaire et les gouvernements provinciaux. L'un de leur principal facteur de succès est l'alignement des besoins et des priorités technologiques. L'objectif est d'élaborer un plan crucial qui indique les partenariats nécessaires, les activités de collaboration et le financement requis à long terme pour qu'une technologie particulière se rende jusqu'aux phases du déploiement et de la diffusion.

- Le radar optique, une technologie du secteur privé, permet de créer des cartes topographiques numériques à haute résolution. Le gouvernement du Canada a passé un contrat pour utiliser cette technologie afin d'obtenir des renseignements détaillés sur les possibilités d'inondation et d'érosion côtières, qui sont essentiels à l'adaptation au changement climatique.

Déploiement et diffusion d'écotechnologies : mesures réglementaires et stimulants

Lorsque les écotechnologies passent avec succès du laboratoire au marché, les mesures stratégiques ciblées telles que les règlements et les stimulants financiers directs peuvent encourager leur utilisation et amener une réduction tangible de la consommation d'énergie et des émissions de GES. Voici des exemples de mesures et de stimulants mis en œuvre dans le contexte canadien.

- Le règlement de la *Loi sur l'efficacité énergétique*, qui a récemment été resserré, établit des normes de rendement énergétique minimales pour un certain nombre de produits énergivores, par exemple les appareils électroménagers, les appareils d'éclairage, les appareils de chauffage et de climatisation, ainsi que les produits qui consomment de l'énergie en mode veille[2] (p. ex. les téléviseurs, les micro-imprimantes et les produits compacts audio). Le règlement envoie un message clair au secteur privé et peut faciliter le commerce d'écoproduits. Il peut aussi inciter l'industrie à s'orienter vers le développement, le déploiement et la commercialisation de technologies plus éconergétiques.

- Pour compléter ces mesures réglementaires, le gouvernement du Canada a annoncé une série d'initiatives écoÉNERGIE, afin de favoriser l'offre d'énergie propre, d'aider les Canadiens à consommer l'énergie plus efficacement et d'élaborer des technologies d'énergie propre. L'Initiative écoÉNERGIE sur l'efficacité énergétique investit environ 300 millions de dollars dans des programmes ciblés qui encouragent une consommation judicieuse de l'énergie dans tous les secteurs de la société. Elle comble les lacunes laissées lorsque le gouvernement ne peut pas réglementer et encourage les Canadiens, les entreprises et les industries à prendre des mesures d'efficacité énergétique.

[2] La consommation d'énergie en mode veille est la plus petite quantité d'électricité consommée par les appareils, laquelle ne peut être interrompue (ou influencée) par l'utilisateur et peut se poursuivre indéfiniment lorsque l'appareil est branché au réseau central.

- Les programmes de sensibilisation des consommateurs tels qu'ÉnerGuide donnent aux consommateurs des renseignements au sujet de la consommation d'énergie d'un produit. Le programme ENERGY STAR, un partenariat dynamique gouvernement-industrie, aide les consommateurs à trouver les produits les plus éconergétiques.

- Le programme de rénovation éconergétique offre des subventions aux ménages canadiens qui ont fait des améliorations éconergétiques dans leur maison. De telles améliorations sont essentielles dans un pays où les températures varient de -35 °C à +35 °C. Jusqu'à maintenant, 50 000 propriétaires ont profité de ces rabais.

- Un stimulant à la production d'énergie renouvelable (0,01 $CAN/kWh) est offert pendant dix ans aux promoteurs de projets admissibles qui favoriseront le déploiement de technologies d'énergie renouvelable. Des fonds ont déjà été engagés pour 32 projets dans le cadre de ce programme.

- Des investissements allant jusqu'à 1,5 milliard de dollars canadiens sur neuf ans favoriseront la production de biocarburants au Canada en offrant des incitatifs d'exploitation aux producteurs de carburants qui remplacent l'essence et le diesel.

- Le Fonds pour l'infrastructure verte permettra de faire des investissements ciblés de un milliard de dollars canadiens, par exemple dans la modernisation des réseaux de transport de l'énergie. Ces investissements doivent inciter d'autres intervenants à investir dans le déploiement de l'énergie durable.

II. COLLABORATION INTERNATIONALE

Le Canada a recours à plusieurs mécanismes internationaux pour accroître la collaboration intergouvernementale au développement et au déploiement de technologies, ainsi que pour aider des pays en développement. Il pense qu'il est important de tirer parti des stratégies et des mécanismes qui existent au sein et à l'extérieur de la CCNUCC, afin d'assurer la cohérence des activités visant à favoriser le développement, le déploiement et le transfert d'écotechnologies.

La collaboration technologique au sein de la CCNUCC

La CCNUCC constitue une solide tribune qui encourage les parties à collaborer davantage au développement et au déploiement de technologies. Le Groupe d'experts en transfert de technologies (GETT) réunit des experts nationaux au sein de la CCNUCC. Il donne aux Parties des conseils sur des questions concernant le développement et le transfert d'écotechnologies tout en respectant leurs droits et obligations d'élaborer, de mettre en œuvre et d'exécuter des stratégies pertinentes pour leur situation particulière. Il a produit notamment le *Guide d'élaboration de projets de transfert de technologies pour la recherche de financement*, un outil utile aux praticiens des projets qui facilite l'établissement de liens entre des promoteurs de projets technologiques et des sources de financement privé aux fins de la mise en œuvre de ces projets.

L'évaluation des besoins technologiques (EBT) est un outil important de la CCNUCC qu'ont utilisé les pays en développement pour cerner leurs besoins technologiques à l'échelle nationale et en établir la priorité. En collaboration avec des partenaires clés (Programme des Nations Unies pour l'environnement – PNUE et Programme des Nations Unies pour le développement - PNUD), le GETT a travaillé à la mise à jour du *Manuel d'évaluation des besoins technologiques en vue de faire face au changement climatique*, qui sera utile aux intervenants qui évaluent les besoins technologiques.

On a réalisé beaucoup d'analyses dans le cadre du PNUE et du PNUD afin de cerner les pratiques exemplaires et les défis liés au processus d'EBT, qui devraient inspirer le présent examen. Il est crucial

que les EBT ne soient pas considérées comme des produits finaux, mais plutôt comme des guides pour la mise en œuvre des priorités technologiques d'un pays. Les EBT servent non seulement à définir les besoins, mais aussi à inciter les intervenants pertinents nationaux et étrangers, tels que les divers paliers de gouvernement et la communauté financière, à définir des partenariats stratégiques dès le début de l'élaboration d'un projet.

Le Canada attend avec impatience la mise en œuvre du Programme stratégique de Poznan pour le transfert de technologie du Fonds pour l'environnement mondial (FEM), qui est axé sur la prochaine étape de la mise en œuvre des résultats des EBT. Ce programme sera financé en partie par le volet technologique du Fonds spécial pour les changements climatiques (FSCC) de la CCNUCC. Le Canada est l'un des pays qui contribuent le plus à ce fonds. Malgré la relative nouveauté de ce programme, il faut souligner que le FEM a adopté une approche remarquable pour le concevoir. En effet, il s'est employé à cerner les points forts et à combler les lacunes de son expérience en matière de technologies, puis à utiliser cette analyse pour tirer parti des activités existantes.

Il faudrait exploiter la synergie avec les initiatives actuelles aux fins de la mise en œuvre du Programme stratégique de Poznan pour le transfert de technologie. Les services d'aide à l'élaboration de projets fournis par le Réseau consultatif sur le financement privé (RCFP) - créé dans le cadre de l'Initiative des technologies climatiques (ITC) de l'Agence internationale de l'énergie (AIE) pour appuyer les travaux sur le financement du GETT - aident les promoteurs de projet à hausser la qualité de leurs propositions afin qu'elles satisfassent aux normes de la communauté financière internationale. Bien que ce programme soit actuellement très efficace, les retombées pourraient en être beaucoup plus grandes et positives s'il avait une plus vaste portée.

Le financement innovateur a occupé une place importante dans les travaux du GETT. En 2004, à titre de président du GETT, le Canada a organisé le premier atelier de la CCNUCC sur les questions liées au financement du changement climatique. Cet atelier était unique, parce qu'on a pu y entendre le point de vue du secteur privé, ce qui a ajouté une précieuse dimension aux discussions. Voici des conclusions clés issues de cet atelier.

- Pour obtenir des investissements pour les activités technologiques, il est primordial de faire preuve de transparence, car cela permet de mesurer et de gérer le risque.
- L'établissement de partenariats à tous les paliers est crucial pour assurer la réussite des projets dans les pays en développement. Les partenariats locaux en particulier sont essentiels, notamment entre les gouvernements nationaux et infranationaux, les investisseurs, les subventionneurs, les organisations non gouvernementales, les fournisseurs de services, les entrepreneurs et les utilisateurs. Il est peu probable que les projets « parachutés » survivent à long terme, en l'absence d'un engagement local.
- Le financement de la technologie n'est pas un aspect complémentaire dont il faut s'occuper aux étapes finales de l'élaboration d'un projet. Il faut plutôt le prendre en considération dès le début pour trouver des partenaires de financement et assurer le succès du projet. Les feuilles de route et les EBT peuvent contribuer à cerner ce besoin.
- Il est essentiel de créer une capacité en élaboration de projet pour attirer les investissements et supprimer les obstacles à l'obtention de capitaux nationaux aux fins de l'investissement direct étranger.
- Il est essentiel de définir et de protéger clairement la propriété intellectuelle pour attirer l'investissement du secteur privé dans n'importe quel pays.
- La création de projets peut accroître l'attrait d'une proposition.

Le GETT a aussi fait une solide contribution aux technologies d'adaptation en rédigeant une communication technique et en organisant divers ateliers qui réunissaient des experts en technologie et en adaptation en vue d'examiner les questions liées aux technologies d'adaptation. Les résultats des

analyses entreprises par le GETT dans ce domaine soulignent les possibilités d'accroître la collaboration sud-sud et les partenariats sud-nord dans le dossier des technologies d'adaptation, particulièrement lorsqu'il est possible d'échanger des connaissances et de reproduire des expériences technologiques. Ces travaux constituent une contribution productive au Programme de travail de Nairobi sur les impacts, la vulnérabilité et l'adaptation au changement climatique. Au fur et à mesure de l'avancement des travaux, il faudra continuer d'explorer la synergie entre les travaux du GETT et ce programme de travail, afin de faire progresser cet important dossier.

Mécanismes multilatéraux

En plus de réaliser des activités technologiques dans le cadre de la CCNUCC, le Canada participe à une multitude de mécanismes multilatéraux qui ont pour résultat l'avancement mondial des écotechnologies.

- Le Canada participe à plusieurs partenariats technologiques internationaux, notamment à plus de 30 accords de mise en œuvre de l'AIE, qui constituent un cadre pour faciliter le lancement, la mise en œuvre, la surveillance et l'examen de projets de R-D entrepris en collaboration par les pays développés et les pays en développement émergeants dans les domaines de l'énergie renouvelable, de l'utilisation finale de l'énergie, des combustibles fossiles, des centres d'information, de la modélisation et de la fusion nucléaire.

- En outre, le Canada est membre de plusieurs partenariats technologiques internationaux, notamment les suivants :
    - le Forum pour le leadership en matière de captage du carbone (FLCC), une initiative internationale sur le changement climatique visant à élaborer des technologies rentables et améliorées pour la séparation et le captage du dioxyde de carbone aux fins de son transport et de son stockage sécuritaires à long terme;
    - le Partenariat Méthane aux marchés, axé sur la récupération rentable à moyen terme du méthane et sur son utilisation comme source d'énergie propre. Le partenariat se veut un mécanisme réunissant des intervenants des gouvernements et du secteur privé en vue de faciliter l'élaboration et la mise en œuvre de projets axés sur le méthane dans le monde entier;
    - le Partenariat pour l'énergie renouvelable et l'efficacité énergétique (PEREE) vise à accélérer la création d'un marché mondial de l'énergie durable en jouant un rôle régional et international de facilitation, de multiplication et de catalyse pour favoriser le changement et créer des systèmes d'énergie durable. En collaboration avec les gouvernements, les entreprises, l'industrie, les financiers et les citoyens du monde entier, il vise à accroître le marché mondial des technologies de l'énergie renouvelable et de l'efficacité énergétique;
    - le Partenariat international pour l'économie de l'hydrogène (PIEH) est un forum de coordination qui vise à accélérer le passage à l'économie de l'hydrogène.

- En tant que membre du Partenariat Asie-Pacifique pour un développement propre et le climat (PAP), le Canada privilégie l'approche unique qui consiste à mettre l'accent sur des activités concrètes réalisées en collaboration avec le secteur privé. Il est crucial que les gouvernements favorisent la participation du secteur privé, car ce dernier a accès aux importantes sources d'investissement et d'innovation requises pour déployer la technologie.

- Le Canada participe activement à des partenariats de science et de technologie énergétiques avec les États-Unis et le Mexique sous les auspices du Groupe de travail nord-américain sur l'énergie (GTNAE). L'objectif de ce groupe de travail est de favoriser la communication et la collaboration entre les gouvernements et les intervenants des secteurs de l'énergie pour les questions énergétiques d'intérêt commun aux trois pays. Il existe maintenant neuf groupes de travail liés au

GTNAE, qui s'intéressent à des sujets comme les sables bitumineux, l'efficacité énergétique et la science et la technologie.

- Le G8 a aussi considérablement contribué au développement de technologies à l'échelle internationale, particulièrement grâce à sa capacité de mobiliser les partenaires pertinents pour combler les lacunes cernées. Voici les principaux efforts déployés par le G8 dans le dossier du changement climatique au cours des dernières années.

    - L'Agence internationale de l'énergie (AIE) a élaboré des recommandations en matière d'efficacité énergétique, qui ont abouti au lancement du Partenariat international pour l'efficacité énergétique et la collaboration (PIEEC).
    - L'AIE et le FLCC ont examiné les possibilités à moyen terme concernant les technologies du CSC. Le Canada a eu le plaisir d'organiser le dernier des trois ateliers en novembre 2007, où l'on a formulé à l'intention du G8 des recommandations clés visant à faire progresser le développement et le déploiement des technologies du CSC. L'AIE et le FLCC poursuivent leurs travaux en collaboration pour favoriser la mise en œuvre mondiale de ces recommandations. Le rapport final sur ces travaux sera présenté au Sommet du G8 de 2010.
    - On a élaboré des feuilles de route technologiques pour les principales technologies, et l'on a poursuivi les travaux sur le CSC entrepris en 2005. L'AIE présentera l'avancement de la mise en œuvre des recommandations sur le CSC à l'occasion du Sommet du G8 de 2010 qui sera organisé par le Canada.
    - La Banque mondiale et les banques régionales de développement ont élaboré un cadre pour l'investissement en énergie, afin d'accélérer l'adoption de technologies qui favorisent la production et la consommation d'énergie de façon moins polluante et plus efficace. Ce cadre a abouti à la création du Fonds d'investissement climatique de la Banque mondiale.

- Le Canada accueille le Secrétariat du Réseau international de forêts modèles (RIFM), qui appuie un réseau volontaire mondial de forêts modèles représentant les principaux écosystèmes forestiers. L'objectif du réseau est de faire progresser l'application des principes de la gestion durable des ressources naturelles et des paysages forestiers par le biais des forêts modèles. Le RIFM favorise l'échange d'information et la collaboration internationale aux dossiers cruciaux des sciences forestières et des sciences sociales qui motivent la recherche de nouveaux modèles d'aménagement forestier.

Initiatives bilatérales

Le gouvernement du Canada a pris des mesures pour aider directement les pays en développement à répondre à leurs besoins technologiques. Ainsi, l'Agence canadienne de développement international (ACDI) a entrepris des activités bilatérales qui comprenaient des projets de transfert de technologie aux fins du changement climatique et un volet de création de capacités pour aider les pays en développement à réduire leurs émissions de gaz à effet de serre (GES) et à contribuer au développement durable. Bien que ces projets bilatéraux aient donné de bons résultats, il s'est présenté d'importants défis liés au développement de technologies dans les pays en développement. Ces défis comprennent la nécessité d'adopter une approche à long terme pour appuyer les activités technologiques, d'accorder une plus grande attention à la pertinence des technologies choisies et de cerner les besoins technologiques du pays visé.

Le Canada est toujours d'accord pour aider les pays en développement à relever le défi du changement climatique, comme en témoigne son engagement de 100 millions de dollars canadiens pris en octobre 2008 aux fins de l'adaptation internationale au changement climatique. L'objectif est d'aider les pays

particulièrement vulnérables aux effets nuisibles du changement climatique, par exemple les pays les moins développés et les petits États insulaires en développement, surtout en Afrique, aux Caraïbes et dans le Pacifique-Sud.

Le Centre de recherches pour le développement international (CRDI) du Canada finance conjointement avec le ministère du Développement international du Royaume-Uni le programme Adaptation aux changements climatiques en Afrique (ACCA). Ce programme vise à créer en Afrique une réserve d'experts autonomes, afin d'accroître la capacité des pays de ce continent à s'adapter aux effets nuisibles du changement climatique. Il vise à accroître la capacité des établissements de recherche à évaluer la vulnérabilité au climat et à élaborer des mesures d'adaptation.

Le logiciel d'analyse de projets d'énergie propre RETScreen est un outil d'aide à la décision et de création de capacités élaboré par le gouvernement du Canada, qui permet aux utilisateurs du monde entier d'évaluer divers facteurs de faisabilité associés à l'élaboration de projets d'énergie renouvelable (p. ex. le coût, la réduction des émissions, la viabilité financière, etc.). Cet outil offert dans le Web en 22 langues a favorisé la réalisation de projets énergétiques représentant plus de 1 000 MW à l'extérieur du Canada, notamment des projets d'hydroélectricité au Brésil, en République tchèque, au Guatemala et au Nicaragua, ainsi que des projets d'énergie photovoltaïque au Costa Rica, en Mauritanie et au Sénégal. En plus des initiatives précédentes, plus de 40 nouveaux ateliers portant sur l'énergie renouvelable, l'efficacité énergétique et la cogénération ont été organisés dans l'ensemble du Canada et du monde (de Calgary, Canada à Manille, Philippines et de Thurles, Irlande à Brazzaville, République du Congo). De plus, un cours d'analyse de projets d'énergie propre à l'aide de RETScreen a été élaboré à l'intention des établissements d'enseignement et des organisations de formation du monde entier. Actuellement, 166 collèges et universités se servent de ce logiciel à des fins de formation et plus de 25 000 personnes consultent le site de RETScreen chaque semaine pour avoir accès à des renseignements.

Le Canada a aussi recours à d'autres mécanismes bilatéraux pour favoriser la collaboration internationale. Il a signé des accords de S-T bilatéraux avec plusieurs pays partenaires, notamment la Chine, l'Union européenne, la France, l'Allemagne, l'Inde, Israël, le Japon et la Corée. Ces accords constituent pour les entreprises et les gouvernements des lignes directrices sur la façon de travailler efficacement avec des pays partenaires en vue d'accroître la capacité internationale en matière de S-T.

III. RECOMMANDATIONS PROPOSÉES

Cette revue des activités nationales et internationales du Canada liées aux technologies climatiques présente de nombreux modèles de collaboration qui peuvent constituer de précieuses pratiques exemplaires que d'autres pays pourront adapter en fonction de leur situation particulière. Les principes directeurs suivants pourraient grandement documenter les recommandations issues de l'examen des engagements en matière de technologie pris en vertu de la CCNUCC.

- Un environnement favorable est un facteur crucial du succès du développement et du déploiement de technologies à long terme. Les cadres réglementaires et stratégiques nationaux devraient envoyer un message clair et fournir des stimulants appropriés aux intervenants pertinents qui participent au processus technologique, notamment le secteur privé.

- Compte tenu de l'ampleur de l'investissement requis, il est primordial que le secteur privé participe au développement et au déploiement des technologies. Il faut explorer des approches qui favoriseront cette participation. On pourrait par exemple établir des partenariats publics-privés innovateurs et élaborer des outils d'évaluation et de gestion du risque qui appuieront les investissements faits par le secteur privé au cours des phases cruciales du développement et du déploiement des technologies.

- Les efforts visant à créer et à conserver une capacité institutionnelle en matière de R-D, particulièrement au cours des premières étapes, sont importants. En plus d'apporter des avantages technologiques directs, une telle capacité peut constituer le fondement de l'établissement de partenariats entre les intervenants en technologie, qui leur permettront de prospérer et d'évoluer au fil du temps.

- Il est probable que les initiatives de transfert de technologie qui réussiront seront fondées sur l'intégration durable et à long terme des technologies dans le pays d'accueil. Au nombre des outils utiles, mentionnons ceux qui aident à autodéterminer les priorités technologiques, facilitent l'appariement des investissements, cernent et suppriment les obstacles clés, encouragent l'éducation et la sensibilisation et appuient l'établissement de partenariats à long terme entre les intervenants.

- Une gamme d'activités liées au climat et à la technologie se déroulent actuellement à l'échelle internationale, tant au sein qu'à l'extérieur de la CCNUCC. Les stratégies internationales visant à faire progresser le développement et le déploiement des écotechnologies devraient comporter les objectifs suivants : cerner les points forts et les points faibles actuels des institutions; combler les lacunes; exploiter les synergies; poursuivre sur la lancée; et éviter la concurrence et le double emploi entre les structures existantes.

- Pour favoriser l'investissement par le secteur privé, les activités internationales pourraient être concentrées sur l'exploration de nouveaux moyens d'intégrer la précieuse perspective des représentants du secteur privé, afin qu'ils soient de véritables partenaires des efforts déployés pour avancer et accélérer les travaux à l'échelle internationale. On pourrait améliorer le GETT en formant un groupe consultatif du secteur privé ou en établissant un partenariat avec une association du secteur privé, par exemple le Conseil mondial des entreprises pour le développement durable.

- L'élaboration d'outils pratiques à l'appui des processus d'évaluation et de prise de décisions, par exemple l'EBT et le manuel du GETT, pourrait aider considérablement les promoteurs de projet technologique des pays en développement. Il faudrait continuer à chercher et à créer des outils analytiques et pratiques pour aider les décideurs en matière de technologie.

- Il est crucial que l'évaluation des besoins technologiques des pays en développement qui ont besoin d'une aide technologique soit axée sur le pays particulier. Il faut cerner les priorités avec l'aide des intervenants et les intégrer aux plus vastes politiques gouvernementales.

Ottawa, Canada
Mars 2009

PAPER NO. 5: COLOMBIA

Colombia's submission to the secretariat in accordance with the Decision -/CP.14 and the paragraph 9 of the terms of reference for the review and assessment of the effectiveness of the implementation of Article 4, paragraph 1(c) and 5, of the Convention, contained in the annex to document FCCC/SBI/2008/L.28.

Colombia considers that it is necessary to take concrete and timely decisions on the subject of the Enhanced action on technology development and transfer to support action on mitigation and adaptation, because we believe that those decisions will be tangible contributions to achieve both goals: climate stabilization and the prevention and reduction of the negative impacts of climate change.

Moreover, we believe that the contributions in terms of transfer of technology should become measurable, reportable and verifiable contributions, from Annex I Parties to non-Annex I Parties that are interested in making efforts to mitigate GHG emissions and achieve development in a sustainable manner, and / or who are suffering from the negative impacts of climate change and need to aid their people in making the necessary adaptations, as is the case of Colombia.

On the areas of focus contained in the annex to document FCCC/SBI/2008/L.28, Colombia considers that,

> In section: (A) Review the extent to which actions have promoted and supported institutional systems and regulatory and legislative frameworks needed to scale up development and transfer of technologies;

We believe that in general cooperation schemes are rather scarce in the international arena, and this is particularly true for most Latin American countries. At the domestic level, these systems and frameworks for technology are frequently fragmented and poorly financed in the developing world. Furthermore, we believe that resources for R&D, towards the technologies required to address climate change challenges, have not grown at the rate required to effectively address the problem, neither in mitigation nor in adaptation, with the latter being frequently sidelined. There is also a shortcoming of efforts on education and access to information.

> In section: (B) Review the range of practical actions taken and identify possible actions to promote innovative public and/or private partnerships and cooperation with the private sector, and consider steps that governments, the business sector and academia can take to facilitate effective participation by the private sector;

There is a noticeable absence of coordinated actions to facilitate, recognize and encourage the deployment and expansion of low carbon lifestyles that do not rely in carbon-based technologies in the first place. Something similar can be said of an environment that promotes public choice towards low carbon lifestyles. Theses aspects should be in coordination with the above, there should be international programs to help in the development, deployment and transfer of technologies adequate to regional needs. These should operate through regional centres and support and incentivise the creation of these activities within development institutions and the creation of technology research entities in key sectors. These should consider not only how to facilitate the deployment, diffusion and scaling up of climate resilient and low carbon technologies, and their role in sustainable growth, but

also how can different policies, measures and actions help create an environment where intermediate and other adequate technologies help avoid emissions, and facilitate adaptation capacity.

Likewise, there is an increasing need to deploy measures at the national and international levels that signal - both through prices and policies - that low carbon growth and climate resilient development are here to stay, and that these should increasingly be addressed by the private sector itself. Financial instruments and funds that facilitate the blending of public, private, bilateral and multilateral resources for the deployment of technologies at the scale required should be encouraged within domestic, regional and international contexts.

In section: (C) Review the mechanisms and processes developed to enhance cooperation with relevant intergovernmental processes;

We believe that the enhancement of existing frameworks for international cooperation and establishment of new ones to accelerate innovative technology development in cooperation with relevant international organizations, through expanding investment in R&D, sharing technology roadmaps, and strengthening international cooperation is needed. It must include exchange programmes for university and college students, expanding networks for knowledge sharing, climate and technology policy support, market assessment, and linking and reinforcing national climate technology centres and especially the establishment of an innovative mechanism to promote cooperation on R&D and transfer of appropriate adaptation technologies to developing countries under the UNFCCC post 2012 framework;

In that sense, for Colombia, the priority sectors and technologies to enhance cooperation on R&D, are those related, but not limited, to crop diversification, varietal improvement, low-carbon technology and energy efficiency, solar electricity, biofuels production with real net GHG reductions, system integration of renewables, and energy efficiency in buildings, transport and industry; irrigation, food safety, flood control, drought management, and modernization of early warning systems covering drought, floods, forest fires and cyclones.

We believe that approaches based on programs, both national and international, offer opportunities to address technology cooperation and the needs at the required scale.

Technology programs should combine both national and international actions, and should also combine domestic policies and incentives together with carbon finance and other innovative financial mechanisms. These could operate under NAMAs, and in the adaptation arena under NAPAs, and be identified through coordinated TNAs by regions.

Due to the scale of the challenge of the needed technologies deployment, all developing countries should consider and encourage the development of NAPA-like and TNA-like assessments. There should be a document prepared by the secretariat that compiles regional needs by technologies, as defined by countries within that region, and suggests areas where technologies could be aggregated to deliver economies of scale, and address the issues of scale and urgency, considering both mitigation and adaptation. This could also help to identify and assess regional needs regarding research and development, and creation of capacities. Guidelines for these should be periodically updated by the EGTT with support from the secretariat and with guidance from parties, and should consider their relation to domestic development programs and priorities, as well as to the institutional setting and national innovation system, where appropriate, in which they will operate. There is also an important

need to support countries in identifying, assessing and deploying TNAs and the activities involved in them.

In section: (D) Review efforts to promote collaborative research and development on and deployment of technologies for mitigation and adaptation;

Colombia has implemented important projects on Adaptation such as the INAP and the Macizo projects, where collaborative and community research and development on and deployment of technologies for mitigation and adaptation. Those experiences showed that endogenous technologies had to be taking in account for successful technologies transfer processes.

In that sense, there is a need to enhance the capacity of DCs to develop and expand endogenous technologies. Regional centres to address technologies on a regional resource base could help improve capacity, practices and processes as well as the technologies themselves. Furthermore test platforms for specific technologies can help to adapt equipment, practices and technologies for their operation in DCs, and for their continuous improvement, as well as for the creation of new endogenous technologies. The cases of the geo-thermal networks in Central America and Mexico and of wind-turbine testing platforms are good examples.

We also recognize that the technology pathway for adaptation is different to that of mitigation. A general principle should consider how to enhance R&D, diffusion and scaling up of good fit adaptation technologies. The characteristics of environments enabling their use, and the circumstances in which they are used, need to be framed in the difference between adaptation and mitigation. Practical adaptation technologies are often intermediate, low capital, labour intensive and culturally relevant, and they frequently contribute to low carbon growth and development. For instance, in a highland Andean setting, artisanal greenhouses, agricultural terracing, and simple animal shelters, help to cope with extreme climate variations; while traditional rainwater harvest practices and community reservoirs can help to cope with the threat of future water scarcity due to glacier retreat. While the contribution of these technologies and practices to the GDP might be relatively small, they frequently employ a large percentage of the economically active population. The research and development, deployment, diffusion and scaling up of such technologies should receive the same attention as mitigation ones do.

Finally, our Country appreciates the progress made by the EGTT to clarify the discussion around the notions of "measurable, reportable and verifiable" in relation to the technologies mentioned in paragraph 1 (b) (ii) of the Bali Action Plan. While we reaffirm the call to implement pilot projects that are set up as examples of technology transfer for adaptation and mitigation. Our Country is strongly interested in developing such projects under the Poznan Strategic Program on TT, and other initiatives promoted by signatory countries to the UNFCCC

In section: (E) Review the adequacy and timeliness of the financial support provided, within the context of Article 4, paragraphs 1(c) and 5, for the purposes of development and transfer of technologies, the related activities and their results.

The provision of new and additional resources must be raised according to common but differentiated responsibilities, respective responsibilities for cumulative, historical GHG emissions and respective capabilities of countries; and scaled up dramatically to be adequate, predictable, sustainable, measurable, reportable, verifiable, new and additional to ODA;

Colombia appreciate the development of Poznan Strategic Program, nevertheless, believe that the resources considered in the Program should not be provided by GEF country allocations but rather by additional resources from the contributions of the parties in accordance with the principle of common but differentiated responsibility. Moreover, our country states that the funding of the Enhanced action on technology development and transfer to support action on mitigation and adaptation must be new and additional, adequate, predictable, stable, and go beyond what was envisaged in the Poznan Strategic Program and take into account the positions expressed by the G77 & China about the MCTF (Multilateral Climate Technology Fund).

Colombia also considers it important to receive all possible support enabling environments and the development of pilot experiences in technology transfer for mitigation and adaptation, being the latter the largest concern for a country as vulnerable to Climate Change as ours.

We ask the Secretariat to produce a document along the lines above for its revision by the EGTT and SBI. This document should help outline the role of national and international programs to address adaptation and mitigation technology needs by regions. These would combine domestic actions and incentives with carbon finance, international support and innovative financial instruments, and support technology combinations in adaptation and mitigation by sectors and within global regions. The document should also suggest opportunities and identify the institutional mechanisms adequate to compile actions and technologies required by regions; identify schemes that promote the development of endogenous technologies, instruments that facilitate the adaptation of existing technologies to better address needs by global regions; the role technology pathways in adaptation and technology; and suggest options for these to work with innovative financial instruments and funds, inter alia. The document would consider its interaction with the Poznan Strategic Program in technology. Finally, it should be reviewed by the EGTT and SBI, and become a contribution to the ongoing work under the AWG-LCA.

PAPER NO. 6: CZECH REPUBLIC ON BEHALF OF THE EUROPEAN COMMUNITY AND ITS MEMBER STATES

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

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

Prague, 12 February 2009

Subject: **Development and transfer of technologies (SBI)**
Submissions based on the areas of focus in the terms of reference for the review and assessment of the effectiveness of the implementation of Article 4, paragraphs 1(c) and 5, of the Convention

A. Introductory and general remarks

1. The Czech Republic, on behalf of the European Community and its member states, reiterates that effective implementation of Article 4, paragraph 5 and Article 4, paragraph 1 (c), of the Convention is important for meeting the overall objective of the Framework Convention. The EU thus welcomes the agreement in Poznan on the terms of reference for the review and assessment of the effectiveness of the implementation of Article 4, paragraph 5, and Article 4 paragraph 1 (c) of the Convention.[1] The EU also welcomes, in response to paragraph 3 of decision -/CP.14 (Development and transfer of technology (SBI)), the opportunity to submit input to this review and assessment.

2. The abovementioned terms of reference lists five main areas of focus for the review and assessment. The EU would like to stress that the effectiveness of international technology cooperation and thus technology development and transfer is a matter of reciprocity and mutual dependence of different Parties. A full understanding of each of the areas of focus would thus require input from different Parties and organisations. Lack or absence of data from any Parties involved in a technology development and transfer activity will reduce the possibility to undertake a comprehensive review and assessment of its effectiveness.

3. As to the issue of data coverage, the EU notes that the areas of focus are very broad and that the time available to prepare submissions is short. In addition, the EU notes that the data coverage can be improved through an appropriate monitoring and reporting systems related to technology development and transfer. The EU stresses the importance of developing a new system for monitoring, reporting and verification as referred to in the Bali Action Plan (Decision 1/CP.13), and welcomes the efforts made so far by the EGTT on developing a set of performance indicators for monitoring and evaluation of technology development and transfer related to the UNFCCC.[2] Any future review and assessment of technology development and transfer efforts should make use of an agreed set of such indicators as an instrument. Due to these circumstances, the EU suggests that the main outcome of this review and assessment should be to provide insights and guidance on mechanisms and approaches that could be used to scale up action on development and transfer of technologies in the future.

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[1] As contained in the annex to document FCCC/SBI/2008/L.28.
[2] FCCC/SB/2008/INF.6

4. In all, the views and experiences of the EU as presented below are only a small sub-set of examples of lessons learned. The EU notes that relevant information on practical steps taken by the European Community and its member states, including the private sector, in the process of development and transfer of technologies have been reported in a previous EU submission on development and transfer of technologies[3] and in National Communications of the European Community and its member states. The fifth round of National Communications, including updated information on technology transfer activities, is currently under preparation and the reports are due by January 1, 2010.

B. Views and experiences related to the areas of focus of the review and assessment

5. The following paragraphs present overall views and experiences of the European Community and its member states related to the areas of focus of the review. More detailed information on activities undertaken is included in Annex 1.

6. The first area of focus of the review is: ***the extent to which actions have promoted and supported institutional systems and regulatory and legislative frameworks needed to scale up development and transfer of technologies***. The EU interprets this as focusing primarily on results (outputs and outcomes) of activities. The outputs and outcomes may, however, be hard to identify due to complex cause-and-effect chains why a focus on activities is inevitable. Among the actions, including approaches and mechanisms, taken by the European Community and its member states in this area, the following are considered to be of particular importance and relevance for the review and assessment:

   (a) The EU's Environmental Technologies Action Plan (ETAP),[4] launched in 2004, is helping to improve the development and promote the wider use of eco-technologies, including climate-friendly technologies. By 2013, ETAP will have been instrumental in channelling over €12 billion towards eco-innovation projects through the sixth and seventh EU R&D Framework Programmes (FP6, FP7) and other EU funding programmes. ETAP has identified 25 actions to overcome barriers that slow down the development and introduction of eco-technologies. These barriers include economic obstacles (such as market-distorting subsidies and the complexity of switching to new technology), unfavourable regulations and standards, lack of targeted research, inadequate availability of risk capital, and lack of market demand. EU member states are addressing these barriers through *eco-innovation 'roadmaps'* setting out the measures they are taking. These roadmaps also provide a basis for sharing and championing promising practices that can have a powerful multiplier effect across the world.
   (b) The EU's community wide emissions trading scheme (EU ETS),[5] launched in 2005, is also helping to improve development, deployment and diffusion of a broad range of mitigation technologies. The EU ETS is linked to the emerging CDM- and JI markets, which are two important mechanisms for technology transfer to developing countries and economies in transition. The implementation of the EU ETS also implies that all EU member states have to take a more strategic approach to their climate policies, and thus stimulates improvements of institutional systems and regulatory and legislative frameworks.
   (c) In the pre-Kyoto Protocol period (1992-1997), governments and private companies from almost 20 member states of the EU participated in the Activities Implemented Jointly (AIJ) as investor or host countries. In addition, EU member states have developed AIJ project in12 developing

[3] FCCC/SBSTA/2006/MISC.10, pp. 11–27.
[4] More information about ETAP is available at: http://ec.europa.eu/environment/etap/index_en.html
[5] More information about EU ETS is available at: http://ec.europa.eu/environment/climat/emission/index_en.htm

countries. Under the AIJ-pilot phase a variety of project types have been implemented covering different mitigation technologies. These projects are hosted by Annex-I, as well as by non-Annex-I countries and have contributed to the development of CDM- and JI-programmes and to technology transfer. The continuation of AIJ is consistent with the EU ambition to improve the conditions for bilateral and multilateral co-operation in order to accomplish broad participation in achieving the ultimate goal of the Convention. The EU is of the view that AIJ could still be a useful instrument to gain experience with new technologies or complex project types before their introduction to the carbon market.

(d) The European Commission and EU member states' government agencies participate (mainly under ODA) in several activities related to human and institutional capacity building in a wide range of developing countries in Latin America, Africa and Asia, which in different ways help facilitate the development and establishment of national institutional systems appropriate for climate technology development, deployment and diffusion. Among the topical areas could be mentioned, e.g., development of national environmental administrations and environmental policies, CDM administration, national and regional clean energy policies and, establishment of climate technology clusters and innovation systems.

(e) Some EU member states (Germany, Denmark and Spain) were key in initiating and almost 20 EU member states are signatory states to the International Renewable Energy Agency (IRENA), which was formally founded in January 2009.[6] Mandated by governments worldwide, IRENA aims at becoming the main driving force in promoting a rapid transition towards the widespread and sustainable use of renewable energy on a global scale. Acting as the global voice for renewable energies, IRENA will provide practical advice and support for both industrialised and developing countries, help them improve their regulatory frameworks and build capacity. The agency will facilitate access to all relevant information including reliable data on the potential of renewable energy, best practices, effective financial mechanisms and state-of-the-art technological expertise.

7. The second area of focus of the review is: ***the range of practical actions taken and identify possible actions to promote innovative public and/or private partnerships and cooperation with the private sector, and consider steps that governments, the business sector and academia can take to facilitate effective participation by the private sector***. Among the actions taken by the European Community and its member states in this area, the following are considered to be of particular importance and relevance for the review and assessment:

(a) The EU's community wide scheme for trading of greenhouse gas emission allowances (EU ETS), which is also linked to the emerging CDM- and JI markets, is designed specifically to incentivise private sector actors to take action on climate change mitigation, including through development and transfer of climate technologies.

(b) One new innovative pilot instrument to involve the private sector is the Global Energy Efficiency and Renewable Energy Fund (GEEREF)[7], which is focused on energy efficiency and renewable energy projects in developing countries and economies in transition. Together the European Commission, Germany and Norway have committed about €110m to the GEEREF over the period 2007-2011 and it is envisaged that further financing from other public and private sources will be forthcoming. GEEREF invests in regionally-oriented investment schemes and prioritises small investments, below €10 million, that are largely ignored by commercial investors and international financial institutions. In December 2008 GEEREF decided on the first investment of €22 million to support projects in sub-Saharan and southern Africa and the other in Asia with a primary focus on India.

[6] More information about IRENA is available at: http://www.irena.org/

[7] More information about GEEREF is available at: http://ec.europa.eu/environment/jrec/energy_fund_en.htm

(c) The Innovation Relay Centre (IRC)[8] network with 240 partners in 31 countries provides transnational technology transfer services for small and medium sized enterprises (SMEs) and R&D institutions based on a common methodology, and tools. From 2006 network partners could experiment cooperation with organizations in third countries which resulted in 25 technology transfer agreements with developing countries of which 15 were related to energy and environment. The services are integrated in the new Enterprise Europe Network with strengthened cooperation possibilities for third countries.

(d) Since the early 2000's, several EU member states have increasingly implemented focused initiatives directed towards private sector actors and aiming at facilitating the export of energy efficiency and renewable energy technologies. These initiatives cover a broad range of instruments, such as: information brokering, networking platforms, business trip programmes, grants, export credits/subsidies.

(e) EU member states (including Austria, Finland, Germany, Sweden and the UK) participate in the Climate Technology Initiative (CTI). The CTI has launched the Private Financing Advisory Network (PFAN) which has been specifically designed to provide support to project developers in attracting private investment into clean technology projects.

8. The third area of focus of the review is: ***the mechanisms and processes developed to enhance cooperation with relevant intergovernmental processes***. The EU is of the opinion that this area is applicable to UNFCCC bodies like the Secretariat and the EGTT, but not to Parties.

9. The fourth area of focus of the review is: ***efforts to promote collaborative research and development on and deployment of technologies for mitigation and adaptation***. Among the actions taken by the European Community and its member states in this area, the following are considered to be of particular importance and relevance for the review and assessment:

(a) The EU has financed research into climate change and technological development (R&D) since the 1980s, facilitating the formulation of realistic policy objectives. The EU's main instrument for R&D funding in Europe is the multi-annual Framework Programme. It brings together scientists from all 27 Member States and is also open to scientists from third countries. As most projects are only partially financed by the EU, EU R&D programmes mobilise additional national funding. The programmes also signal European research priorities to national research communities and the private sector, triggering additional research. International cooperation is an integral part of the EU's R&D framework programmes. Under the 6th Framework Programme, €600 million was allocated to funding scientists from third countries, so they could participate in EU-supported research projects, and to projects aimed at establishing international cooperation in specific fields. This is expected to rise under the 7th Framework Programme (FP7).[9] Several new specific instruments (twinning, Specific International Cooperation Actions, coordinated call) support cooperation with targeted third countries on one or several particular topics in the framework of FP7 (2007 – 2013). The total EU budget for the FP7 non-nuclear energy programme is €2.3 billion. Activities include renewable energy technologies, energy savings and efficiency, clean coal and CO2 capture and storage technologies, smart energy networks and knowledge for energy policy making.

(b) The European Energy Technology Platforms (ETPs)[10] were set up to define, at European level, common strategic research agendas which should mobilise a critical mass of national

[8] More information about IRC Network is available at: http://www.innovationrelay.net/

[9] More information about FP7 is available at: http://ec.europa.eu/research/fp7/index_en.cfm

[10] More information about the technology platforms is available at: http://cordis.europa.eu/technology-platforms/home_en.html

and European public and private resources. The ETPs also represent a forum for discussion and exchange views on benefits for R&D cooperation with well targeted international partners. There are 6 ETPs in non-nuclear energy (PV, SmartGrids, Biofuels, Zero-emission fossil fuel plants, Solar Thermal, Wind).

(c) The European Commission and several EU member states participate since several decades in a multitude of international collaborative R&D partnerships on new energy technologies, run as so-called Implementing Agreements under the International Energy Agency (IEA). The IEA created a legal contract – Implementing Agreement – and a system of standard rules and regulations to encourage collaborative efforts to meet these energy challenges.[11] This allows interested member and non-member governments or other organisations to pool resources and to foster the research, development and deployment of particular technologies. For more than 30 years, this international technology collaboration has been a fundamental building block in facilitating progress of new or improved energy technologies.

(d) The EU contributes actively to the development and transfer of technological know-how and related human and institutional capacity-building by means of international cooperation on higher education on technology. This is important as a precursor for scaling up international R&D collaboration. Through exchange programmes such as the EU-Asia Link students from developing countries are able to enrol in undergraduate and graduate study programmes at European technical universities. Some technical universities in EU member states run free of charge Masters programmes on sustainable energy system, environmental technology and sustainable infrastructure etc., which are designed and directed specifically to students from developing countries. European technical universities are also engaged in development of university programmes on clean energy and environmental technology at technical universities in Latin America, Asia and Africa.

(e) In June 2005 the EU and the group of African, Caribbean and Pacific countries launched the *Energy Facility* with the general objective to contribute to achieving the Millennium Development Goals (MDGs), e.g. poverty reduction through increased access to sustainable energy services in rural and peri-urban areas. 75 projects have been selected following a Call for Proposals launched in 2006 for a total project cost of €426 million and an EC contribution of €196 million. Most of the projects include a component of transfer of renewable energy/energy efficiency technologies. The Facility was structured into three components, dealing with: 1) access to energy services (through both small scale initiatives and large infrastructure projects); 2) governance and management in the energy sector; 3) cross-border interconnections. The Facility has been successful in attracting additional funding from other sources (leverage effect of 1.1). It has also registered a significant involvement of the private sector, both as an applicant and as a partner (26 projects for a total project cost of €153 million and an EC funding of €74 million). A second Energy Facility will be funded in the framework of the 10th EDF.

(f) The EU is currently working on a number of concrete projects for large scale low carbon technology development and deployment. For instance, the Mediterranean Solar Plan is an initiative launched during the Paris Summit for the Mediterranean (13 July 2008) to implement in total 12 GW installations of Concentrated Solar Power plants in the Northern African Region with network connection to Europe to make the project viable.

(g) The EU also contributes to and participates in the Consultative Group International Agricultural Research (CGIAR) that is engaged in adaptation activities as well as in other climate change related fields. The priorities of CGIAR research are: Reducing hunger and malnutrition by producing more and better food through genetic improvement; Sustaining agriculture biodiversity both in situ and ex situ; Promoting opportunities for economic

[11] More information about IEA implementing agreements is available at: http://www.iea.org/Textbase/techno/index.asp

development and through agricultural diversification and high-value commodities and products; Ensuring sustainable management and conservation of water, land and forests; Improving policies and facilitating institutional innovation. A critical task for 11 of the CGIAR Centers is to maintain international gene banks, which preserve and make readily available the plant genetic resources that form the basis of food security worldwide. In addition, the CGIAR implements several innovative "Challenge Programs" designed to confront global or regional issues of vital importance. Implemented through broad-based research partnerships, Challenge Programs mobilize knowledge, technology and resources to solve those and other problems such as micronutrient deficiencies, which afflict more than three billion people; water scarcity, which already affects a third of the world's population; and climate change, which poses a dire threat to rural livelihoods across the developing world.

10. The fifth and final area of focus of the review is: ***the adequacy and timeliness of the financial support provided, within the context of Article 4.1(c) and 4.5, for the purposes of development and transfer of technologies, the related activities and their results***. As indicated in the general remarks above, it is very hard for a "donor" type Party like the European Community and its member states to assess comprehensively the adequacy and timeliness of support, since this depends on clarity of "recipient" Parties' needs. The EU acknowledges that progress made by non-Annex I Parties on producing Technology Needs Assessments (TNAs) are expected to lead to more clear financing needs and investment programmes. The EU believes that financing needs can only be realistically satisfied if further efforts are undertaken to allow those in need to access the widest possible range of relevant financial flows, both within and outside the UNFCCC process as well as public and private sources. As the largest donor, the EU has already made substantial financial resources available that are of immediate relevance to promoting the development and transfer of technologies. The EU is a major contributor to the *Global Environmental Facility, The Special Climate Change Fund, the Adaptation Fund*, and the resources being generated through the emerging *CDM/JI* markets are likely to continue to ensure follow-up on the further development and implementation of TNAs, at least in the short term.

11. On specific financing of action in developing countries, the European Commission recently launched the Global Climate Change Alliance (GCCA). To kick start the initiative the Commission has earmarked €50 million over the period 2008-2010 including for enhancing participation in the global carbon market via the CDM. A number of EU member states are also contributing financially to GCCA. CDM is proving to be a crucial channel of investment and clean technology for developing countries. EU is driving demand for CDM credits through direct purchases by governments and through the EU ETS which accepts credits from most types of CDM projects. Governments have budgeted to buy €2.9 billion worth of CDM credits to meet their 2008-2012 emissions commitments under Kyoto. This translates into just over 500 million tonnes of CO_2 over the period. At the same time, under the EU ETS, EU member states will be able to buy CDM and JI credits for up to almost 1.4 billion tonnes of CO_2 if needed to cover their emissions. So the EU, and the EU ETS, are channeling very considerable investment in clean technology for developing countries through the CDM.

12. In addition, most EU member states run own programmes related to development and transfer of technologies and some provide finance to the World Bank and the Regional Development Banks initiative Clean Energy Investment Framework (CEIF) and more recently the World Bank Climate Technology Fund (CTF). Annex 1 to this note provides, by way of example, a list of EU sponsored activities and partnerships that are relevant for the work undertaken on technology development and transfer under the UNFCCC.

ANNEX 1. Examples of EU sponsored technology based activities and partnerships relevant to the UNFCCC

The EC and its member states play an active role in the promotion of the development and transfer of technology. This Annex includes a preliminary and non-exhaustive list of EU-sponsored and climate change related technology co-operation initiatives and partnerships. The list provides an illustration of the EU's (and other Parties') active role in this field with the vast number of initiatives contributing to the promotion of the development and transfer of development.

A number of criteria were considered for including agreements that are of particular relevance to present and future international climate change programmes. These criteria include:

- Extent of involvement of nations with emerging or developing economies;
- Extent to which Agreements are involved in stimulating development or deployment projects as opposed to information exchange;
- Technology;
- Funding mechanism – shared effort or shared funding.

TECHNOLOGY COOPERATION	Nature of Agreement	Nature of cooperation	Financing & available budgets	Country involvement	Technologies covered
Access to modern energy services Rwanda (German/Dutch)	Bilateral	Rural electrification through grid extension and densification	2.70 MEUR	Rwanda	
Utilization of biomass potential (agrobusiness wastes) for the generation of electric energy in Kenya (German)	Bilateral	Construction of a biogas plant in a dairy	0.38 MEUR	Kenya	
Sino-German Coal Fire research	Bilateral	Research project aims to develop of a first methodology to get coal fire fighting activities in line with the CDM regulations.	5.90 MEUR	China	Innovative Technologies for Exploration, Extinction, and Monitoring of Coal Fires
Sino-German Research Projects on Sustainable Land Use	Bilateral	Scientific-technological cooperation in the area of ecological research and environment technologies	12 MEUR	China	Biogas production, Jatropha-based biofuel production, technologies for agro-ecosystems
Solar Chill: Application of solar driven environmentally friendly freezers and refrigerators in African areas remote from power supply (German)	Bilateral	It is planned to distribute solar driven refrigerants with non-electric thermal storages in various African countries.	2 MEUR	African countries	Solar technologies

TECHNOLOGY COOPERATION	Nature of Agreement	Nature of cooperation	Financing & available budgets	Country involvement	Technologies covered
Accomplishing of a CDM Project for local electrification/ replacement of fuel generators in villages and small towns in Burkina Faso (German)	Bilateral	About 10 biomass gasifiers which use crop residues for power generation will be installed in villages and small towns, and operated by local cooperatives.	2.8 MEUR	Burkina Faso	Biomass gasifiers
Public-private partnership with BSH Bosch Siemens domestic appliances (plant oil stoves) in Tanzania (German)	Bilateral	Deployment and adaptation of plant oil stoves to African conditions	0.86 MEUR	Tanzania	
Construction of a rainwater storage and energy generation project (German)	Bilateral	The aim is the pilot implementation of replicable climate measures in the first eco-campus in Africa, at the Ghana Valley View University.	1.4 MEUR	Ghana	Biogas and solar cells
German-Chinese platform for renewable energies, initially focused on wind energy	Bilateral	The Chinese-German platform for renewable energies focuses primarily on wind energy. The project aims at the development of technical and legal capacities in order to enhance the feed-in of sustainable electricity and the efficiency of wind energy.	4.3 MEUR	China	Renewable energies
Climate-neutral energy supply for rural areas (German)	Bilateral	The goal of the project is to develop an economic and financially viable model for income-producing energy supply, to be offered by the National Bank for Agriculture and Rural Development in India.	2.5 MEUR	India	Renewable energies
Promoting renewable energy technology under the Self-Sufficient Village Energy Programme	Bilateral	By using modern renewable energy technology, 3-5 villages in Indonesia are to become independent of traditional fossil fuels.	0.3 MEUR	Indonesia	
1000 Rooves Programme: Dissemination of solar thermal hot water generation	Bilateral	The project aims at the increased use of solar thermal installations as a resource-friendly alternative to generating hot water in different regions, as well as in different areas of application.	1 MEUR	Brazil	Solar-thermal
Lokoho small hydro power for rural development: co-operation with the e7-fund of the world's biggest electricity suppliers in Madagascar (German)	Bilateral	Rural electrification: construction of a small hydro power plant (feed-in and new connections)	1.00 MEUR	Madagascar	

TECHNOLOGY COOPERATION	Nature of Agreement	Nature of cooperation	Financing & available budgets	Country involvement	Technologies covered
German support for implementation of UNFCCC in Tunisia	Bilateral	The project focuses on two components: CDM and vulnerability and adaptation to climate changes	1.5 MEUR	Tunisia	
Promotion of Renewable Energies in Tanzania (rural areas) (German)	Bilateral	Testing of market structures that facilitate a broad use of renewable energies, energy advisory services, training	1.53 MEUR	Tanzania	
Household energy in rural areas (HERA) (German)	Multi-lateral	Advisory services and dissemination of concepts to meet basic energy needs (households and small enterprises)	1.91 MEUR		
Sustainable utilisation of natural resources for improved food security in Ethiopia (German/Dutch)	Bilateral	Dissemination of improved biomass stoves	12.04 MEUR	Ethiopia	
Conservation and management of natural resources in Benin (German/Dutch)	Bilateral	Dissemination of improved biomass stoves	12.65 MEUR	Benin	
German Climate Protection Programme for Developing Countries (CaPP)	Multi-lateral	Reduction of greenhouse gas emissions in energy, transport, industry and waste management,; Development of national strategies in CDM host countries; Establishment of Designated National Authorities; Capacity building for CDM; Development of options for addressing adaptation issues in sustainable development; Establishment of networks among experts in developing countries; Support adaptation measures; and to facilitate policy dialogue.	17.6 MEUR	Supraregional More than 30 countries, including Indonesia, Chile, China, Colombia, Ghana, Morocco, Peru, South Africa and Tunisia	
Environmentally sound energy supply in the Antsiranana region (GREEN MAD) in Madagascar (German)	Bilateral	Sustainable forest cultivation, household energy (improved stoves and efficient energy consumption) in (peri)urban areas	2.39 MEUR	Madagascar	
German International Climate Protection Initiative	Multi-lateral	Improving energy efficiency, Developing renewable energies, Reducing F-gases (fluorocarbons) which have a harmful impact on climate through investment measures and the promotion of capacity-building in	60 MEUR		

TECHNOLOGY COOPERATION	Nature of Agreement	Nature of cooperation	Financing & available budgets	Country involvement	Technologies covered
		emerging, developing and transition countries.			
Renewable energy and energy efficiency promotion in Tunisia (German)	Bilateral	Institution strengthening, integration of topics into policies, framework conditions for involving the private sector	3.07 MEUR	Tunisia	
German Mission for the Support of CILSS in Burkina Faso/Mali	Bilateral	Support of CILSS (Comité Permanent Inter Etats de Lutte Contre la Sécheresse au Sahel). Dissemination of improved biomass stoves in	3.30 MEUR	Burkina Faso/ Mali	
The Sustainable City (Swedish)	Multi-lateral	Testing of transfer of techniques for sustainable urban planning based on state of the art Swedish environmentally sound technologies to two pilot cities in Mongolia		Mongolia	
Transfer of environmental technologies for sustainable development in Developing Countries (Swedish)	Multi-lateral	Exploring innovative ways of transferring Swedish environmentally sound technologies to reach sustainable development in developing countries. Partly implemented through a ”challenge fund” with competition between ides on how to best transfer environmentally sound technologies from Sweden to developing countries	3.9 MEUR	Developing countries	
Sweden-Zambia	Bilateral	Providing electricity services using photovoltaic solar systems through energy service companies in rural areas of Zambia. Developing methods of supplying photovoltaic panels to rural areas.	0.5 MEUR	Zambia	
Environmental Program (urban/industrial sector) in Morocco (German)	Bilateral	Energy Advisory Services: Promotion of national environmental policies, implementation of environmental protection measures	4.5 MEUR	Morocco	
Rural Trade and Industry Promotion Project (RUTIPP) in Ghana (German/Dutch)	Bilateral	Electrification for productive use through grid extension	4.50 MEUR	Ghana	

TECHNOLOGY COOPERATION	Nature of Agreement	Nature of cooperation	Financing & available budgets	Country involvement	Technologies covered
Danish Mixed Credit Programme	Bilateral	Public and private sector investments	5.30 MEUR annually	Global	Facilitating investments in energy and infrastructure
Danish Business-to-Business programme	Bilateral	Technology transfer through business partnerships	28 MEUR annually 2007-09	Uganda Tanzania Mozambique South Africa Ghana, Bangladesh, Vietnam and more	Renewable energy Industry, Agriculture
Danish Partnership Facility	Bilateral	Private Sector Cooperation	5,3 MEUR (2007)	China , Thailand, Malaysia, m	
Energy efficiency program in Nepal (Denmark)	Bilateral	The program is expected to supply over 1 million homes with modern energy solutions, including improved stoves, hydropower, and solar power.	150 MDKK (2007-2012)	Nepal	Improved stoves, hydropower, solar power, energy efficiency
Program for renewable energy support in China (Denmark)	Bilateral	Bilateral sector programs	100 MDKK (2008)	China	Renewable energy
Cooperation on establishing wind power capacity in China (Denmark)	Bilateral	Bilateral sector programs	45 MDKK (2006-2008)	China	Wind power
Danish contribution to the World Bank's energy program (ESMAP)	Multilateral	Renewable energy in the poorest countries	45 MDKK (2005-2009)	Developing countries	
Danish contribution to the Asian Development Bank	Multilateral	Support to the development of sustainable energy in Asia	50 MDKK (2002-2007)	Asian countries	
Danish contribution to the Global Network for Sustainable Development (GNESD)	Multilateral		9.5 MDKK (2003-2010)		
Danish contribution to the Least Developed Countries Fund and the Special Climate Change Fund under GEF	Multilateral	Technology Transfer	130 MDKK (2005-2008)		
Energy Advisory Project in Uganda (EAP) (German/Dutch)	Bilateral	Energy advisory services, dissemination of improved biomass stoves, rural electrification through solar home systems and other technologies	5.45 MEUR	Uganda	
Building up of modern Climate Database (CLIDATA) (Czech Republic)	Multilateral	Provision of hardware, software and training of administrator and users of climate database system CLIDATA for connection of climate data with the geographical information system (GIS).	7 MCZK (2004-2006)	Ethiopia, Serbia, Bosnia and Herzegovina, Dominican Republic	Database management system

TECHNOLOGY COOPERATION	Nature of Agreement	Nature of cooperation	Financing & available budgets	Country involvement	Technologies covered
Improvement of the environment in Moldova through application of environmental technologies produced in joint-ventures (Czech Republic)	Bilateral	Private Sector Cooperation, training of experts, transfer of know-how	12 MCZK (2005-2008)	Moldova	Wastewater treatment
Building of the effective district heating system (Czech Rep.)	Bilateral	Dissemination of the self-contained, efficient heat distribution network.	18 MCZK (2006-2008)	Serbia	Heat distribution network
Risk assessment and glacier lakes dams outbursts mitigation in Kyrgyzstan (Czech Rep.)	Bilateral	Installation of early warning systems, monitoring stations outburst risk assessment.	15 MCZK (2007-2010)	Kyrgyzstan	
Program for Biomass Energy Conservation in Southern Africa (ProBEC) (German/Dutch)	Bilateral	Dissemination of improved biomass stoves, productive use	6.19 MEUR	Southern Africa	
Promotion of cooperation between African nations in the energy sector (Energizing Africa) (German)	Multi-lateral	Energy advisory services, promotion of SMEEs in rural areas	6.35 MEUR		
Promotion of Private Sector Development in Agriculture in Kenya (German/Dutch)	Bilateral	Dissemination of improved biomass stoves	6.90 MEUR	Kenya	
Promotion of Rural Electrification and Sustainable Supply of Biomass Energy in Senegal (PERACOD) (German/Dutch)	Bilateral	Dissemination of improved biomass stoves, afforestation, rural electrification (isolated grids, solar home systems), productive use	7.88 MEUR	Senegal	
Program for decentralisation and communal development in Benin (German/Dutch)	Bilateral	Rural electrification through grid extension and densification	8.95 MEUR	Benin	
International Partnership on Bioenergy	Plurilateral	New international partnership on bioenergy.	Being established.		Italy is initiating this partnership.
CEDEX (Centre for Studies and Experimentation of Public Infrastructures), Spain	Bilateral	Cooperation programme on technology: electronic tools in Latin America (i.e. software to prevent and alert on natural - water related- environmental disasters in the Region)	CEDEX (ministry for Public Works) with other institutions from the host countries	Spain – LAC and others	Water management, transport, Low carbon technologies, land use…
BCIE (Central American Bank for the Economic Integration) and ICO (Official Credit Institute) Spain	Bilateral	Financing of projects in the Central American Region to promote the economic development of the area with low-carbon economies through the promotion of renewable energies.	ICO, Ministry for Industry, Tourism and Trade, Spain	Spain and Guatemala, El Salvador, Honduras, Nicaragua y Costa Rica	

TECHNOLOGY COOPERATION	Nature of Agreement	Nature of cooperation	Financing & available budgets	Country involvement	Technologies covered
Global Bioenergy Partnership (GBEP)	Multi-lateral	Non-binding voluntary agreement for cooperation activities to be related to production, delivery, conversion, use and trade of bioenergy	Being established on May 2006. Support from Partners	Current partners are: Brazil, Canada, China, France, Germany, Italy, Japan, Mexico, Netherlands, Russian Federation, Spain, Sudan, Sweden, Tanzania, United Kingdom, United States of America, FAO, IEA, UNCTAD, UN/DESA, UNDP, UNEP, UNIDO, UN Foundation, World Council for Renewable Energy (WCRE) and European Biomass Industry Association (EUBIA).	Bioenergy technologies
Spain: Memorandums of understanding in the climate change field with a special focus on CDM projects	Bilateral	Support in the identification and promotion of CDM projects		Argentina, Brazil, Colombia, México, Panamá, Uruguay, República Dominicana, Bolivia, Ecuador, Chile, Costa Rica, Paraguay, Guatemala, El Salvador, Peru, Nicaragua, Honduras Marruecos, China, Egypt y Ukraine.	Renewable energies, energy efficiency, waste management, , transports
Spain - World Bank Carbon Finance Unit: Biocarbon Fund/Community Development Carbon Fund/Spanish Carbon Fund/Carbon Partnership Facility	Multilateral	Carbon Funds, CDM and JI projects	344 MEUR (2005-2012)	Developing countries and countries with economies in transition.	Renewable energies, energy efficiency, waste management, sinks, transports,etc

TECHNOLOGY COOPERATION	Nature of Agreement	Nature of cooperation	Financing & available budgets	Country involvement	Technologies covered
Spain - World Bank Carbon Finance Uni: CF-Assist/Carbon Assets Development Fund/Preparatory Fund	Multilateral	Capacity building	16,2 MEUR (2005-2012)	Developing countries and countries with economies in transition.	Renewable energies, energy efficiency, land fill management, sinks, transports, reducing emissions from deforestation and degradation, etc
Spain - Corporación Andina de Fomento (Iniciativa Iberoamericana de Carbono)	Multilateral	Carbon Funds	47 MEUR (2005-2012)	Latinamerican countries	Renewable energies and energy efficiency.
Spain - European Bank Development and Reconstruction and European Investment Bank (Multilateral Credit Carbon Fund)	Multilateral	Carbon Funds	35 MEUR (2005-2012)	Developing countries and countries with economies in transition.	Renewable energies and energy efficiency.
Spain - Asian Development Bank (Asian Pacific Carbon Fund)	Multilateral	Carbon Funds	30 MEUR (2005-2012)	Developing countries in Asia	Renewable energies, energy efficiency, waste management, sinks, transports,etc
Spanish contribution to the Clean Technology Fund (Climate Investment Funds)	Multilateral	Demonstration, deployment and transfer of low carbon technologies	80 MEUR (2008-2012)	Country access will be based on: ODA-elegibility and an active MDB country program	Low-carbon technologies with a significant potential for log-term GHG emissions savings
Spain - World Meteorological Organization Trust Fund	Multilateral	Technology Transfer/ capacity building	3.3 MEUR (2006-2008)	Africa and Latinoamerica	Systematic observation, Climate and weather modelling and tools
Spain - European Bank for Development and Reconstruction (Sustainable Energy Initiative)	Multilateral	Technology Transfer	4 MEUR (2007-2008)	Developing countries and countries with economies in transition.	Energy Efficiency and Renewable Energies
Spain - Asian Development Bank (Clean Energy Financing Partnership Facility)	Multilateral	Technology Transfer	5 MEUR (2006-2012)	Developing countries	Energy Efficiency and Renewable Energies
Spain - Interamerican Development Bank (Sustainable Energy and Climate Change Initiative)	Multilateral	Technology Transfer/ capacity building	10 MEUR (2007-2008)	Latinamerican countries	Energy Efficiency, Renewable Energies, Biofuels, Carbon Finance
Spanish contribution to the International Strategy for Disaster Reduction (ISDR),	Multilateral	Technology Transfer/ capacity building	1 MEUR (2008)	Latinamerican countries	Integration of Climite Change

TECHNOLOGY COOPERATION	Nature of Agreement	Nature of cooperation	Financing & available budgets	Country involvement	Technologies covered
American Regional Unit					Adaptation and Disaster Risk Reduction
Spain - Economic Commission for Latinamerican and the Caribbean	Multilateral	capacity building	200 000 EUR (2007-2008)	Latinamerican countries	Programmatic CDM, REDD, Adaptation, Regional Climate Change Scenarios
Spanish contribution to the Special Climate Change Fund (Focusing on Technology Transfer)	Multilateral	Technology Transfer	2,5 MEUR (2006-2008)	Developing countries	Energy Efficiency, Renewable Energies
Spanish contribution to the MDG Fund UNDP (Climate Change and Environment Window)	Multilateral	Technology Transfer/ capacity building	64 MEUR (2007-2011)	Afghanistan, Bosnia-Herzegovina, China, Colombia, Ecuador, Egypt, Guatemala, Jordan, Mauritania, Mozambique, Nicaragua, Panamá, Peru, Filipinas, Senegal, Turkey.	Mitigation and Adaptation Capacity Building and Technology Transfer Projects
Spanish support to Renewable Energies and energy efficiency projects	Bilateral	Technology Transfer/ capacity building	73,7 MEUR (2005-2007)	Developing countries in America, Asia, Africa and economies in transition in Europe	Renewable energies and technologies to improve energy efficiency
Projects implemented under the Activities Implemented Jointly (AIJ) mechanism (Netherlands)	Multilateral	Since the introduction of AIJ in 1995 the Netherlands program funded 25 AIJ projects in 14 countries.		Annex I and Non-Annex I countries of the UNFCCC	Environmentally friendly technology and know-how
Marrakech funds	Multi-lateral and bilateral	Created at COP6 and COP7; Special Climate Change Fund (SCCF), LDC (Least Developed Countries) Fund, Kyoto Protocol Adaptation Fund.	Funds pledged by parties to UNFCCC. LDC fund value US$33m (by2005). SCCF value US$7m (by 2005) Protocol fund financed by a share of the CDM projects. *Contributions by EU member states:* Germany: 40 MEUR (SCCF), 20 MEUR (LDCF) France : 10 MEUR (LDCF, 2007-2010)		Availability of funds dependent on party status and nature of project
Dialogue on Climate Change, Clean Energy and Sustainable Development	Plurilateral	Dialogue to address sustainable energy systems, share best practice, monitor Gleneagles Plan of Action (2005)	G8	G8, other countries with significant energy needs	Energy use, cleaner power generation, Managing the impact of climate change

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Action Plan on Science and Technology for Sustainable Development	Plurilateral	Co-operative scientific research on transformational technologies. Action plan 2003.	G8 action plan	G8	Large energy section
German Export Initiative Renewable Energies	'Unilateral' with numerous partner countries	The initiative aims at improving the capacities of small and medium sized enterprises from the RE sector to enter foreign markets – thus fostering transfer of German Renewable Energy Technologies. Start of programme: 2004.	German Federal Ministry of economics and technology: 12 Mio. EUR in 2006.	numerous partner countries. Inter alia: Tanzania, South Africa, Kenya, Morocco, Tunisia.	Renewable Energy technologies planned to expand scope to Energy Efficiency Technologies from 2007 onwards.
Flexible Mechanisms -CDM	Bi-lateral	Mechanism under UNFCCC between Annex1 and non-Annex1 Parties	Issuance of CERs upon verification of implementation in non-Annex1 country		any non-Annex 1 party to the UNFCCC
Flexible Mechanisms - JI	Bi-lateral	Mechanism under UNFCCC between Annex1 and other Annex1 parties.	Issuance of emission reduction units upon verification of implementation and reduction in host country	Hosts mainly transition economies	All covered under Article 4.6
UK-China Memorandum of Understanding	Bilateral	MoU 2005 is an amendment, to include energy technology co-operation, to the original Protocol on Scientific and Technological Co-operation from 1978	China's Ministry of Science and Technology (MoST) and DTI	UK, China	Clean Coal Technologies and renewable energy
US/UK Memorandum of Understanding -Energy Dialogue	Bilateral	Memorandum of Understanding (MoU) on energy R&D between the DTI and the US Department of Energy, signed in 2000. The MoU provides a legal framework for collaboration between the US and the UK on energy R&D.	DTI and DoE funders	UK, US	Several workstreams inc one on energy technologies and recent initiatives on fossil fuels, CCS and hydrogen.
UK-India	Bilateral	Collaborative study to identify barriers to technology transfer.	Funded by the UK	UK, India	Generic low energy technology
Advancing Capacity for Climate Change Adaptation (ACCCA) (UK)	Multilateral	Number of projects to build adaptive capacity in different African States.	Funded by UK and European Commission	Kenya (2 projects), Malawi, Mali, Nigeria, Tunisia (to date)	Adaptation capacity in Africa
UK-Thailand Memorandum of Understanding	Bi-lateral	Collaboration on projects and joint venture to promote renewable energy.	Thailand's Ministry of Science, Technology and the Environment (MOSTE) and UK's DTI	UK, Thailand	Renewable Energy

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UK-Philippines MoU	Bi-lateral	Memorandum of Understanding (MoU)	Some finance through governments	UK, Phillipines	Power sector management and sustainable energy transfer
Climate for Development in Africa – ClivDev Africa (GCOS)	Multilateral	To strengthen the climate resilience of Africa's efforts to reach the Millennium Development Goals, focusing on hunger and health.	£ 5 million over 5 years by UK	Various countries in the four sub-regions of sub-Saharan Africa.	Agriculture, health and water
Italy-India	Bi-lateral	MoU signed in 2005 in the field of climate change		Italy (Italian Ministry for the Environment and Territory), India (Ministry of Environment and Forests, Ministry of Non-conventional Energy Sources)	Hydrogen Fuel cells, carbon sequestration
Italy-US	Bi-lateral	Since 2002 Science and Technology cooperation in the field of climate change		Italy, US	Zero and low carbon, hydrogen fuel cells
Italy and the Caribbean Community Climate Change Center (CCCC)	MoU	Allow the start up of the activity of the CCCC and jointly develop and implement programmes, projects and activities that enhance regional institutional capabilities to respond to the negative effects of climate change.	740.000 USD	Caribbean countries	
Italy - Mozambique	Bilateral	MoU signed in 2007 to promote the development and deployment of bioenergy in Mozambique		Italy (Italian Ministry for the Environment Land and Sea), Mozambique (Ministry of Energy of the Republic of Mozambique)	Bioenergy technologies
Italy-Austria-Municipality of Milan-Pacific Small Islands States (Pacific SIDS: the Republic of the Fiji Islands, the Republic of Kiribati, the Republic of the Marshall Islands, the Federated States of Micronesia, the Republic of Nauru, the Republic of Palau, the Independent State of Papua New Guinea, the Independent State of Samoa, the Solomon Islands, the Kingdom of Tonga, Tuvalu, the Republic of Vanuatu, Cook Islands, Niue	Partnership Program	Since May 2007		the Governments of Fiji Islands, Kiribati, Marshall Islands, Micronesia, Nauru Palau, Papua New Guinea, Samoa, Solomon Islands, the Kingdom of Tonga, Tuvalu, Vanuatu, Cook Islands, Niue	Climate Change Forecast modeling Renewable energy and energy efficiency technologies, with particular concern to photovoltaic, wind and Biofuels

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Italy-Serbia MoU	Bilateral	Memorandum of understanding and its yearly based technical annexes for an environmental cooperation programme for the promotion of sustainable development, strengthening of national institutions, with particular reference to the implementation of the Kyoto Protocol and the realization of potential CDM projects in the fields of solar and wind energy, small hydro, energy efficiency, biomass		Italian Ministry For the Environment, Land And Sea and Serbian Ministry of Environment and Spatial Planning and other central and local Administrations	Renewable energies
Sino-Italian Cooperation Program for Environmental Protection (SICP)	Bi-lateral	On the basis of several MoUs starting form 2000 with different Chinese institutions, SICP financed so far 82 joint projects. Technology transfer activities are carried on in the field of energy efficiency and renewable energies, CDMs, water management, sustainable urban planning and eco-building, low emission transportation, sustainable agriculture and forestry , pollution monitoring and control	Italy, China, World Bank, Multilateral Funds, GEF, private companies	Italian Ministry for the Environment, Land and Sea, the Chinese Ministry of Environmental Protection (MEP), the Chinese Academy of Social Sciences (CASS), the Ministry of Science and Technology (MOST), the Chinese Ministry of Water Resources, The State Forestry, Administration , the National Development Reform Commission (NDRC), Beijing, Shanghai ,Tianjin, Xian, Suzhou, Lanzhou and Urumqi Municipalities , Tsinghua University in Beijing, Tongji University in Shanghai	Eco-building technologies and materials, solar and biomass energy technologies, clean coal (including IGCC) and carbon sequestration, waste to energy production, geothermal energy production, higher capacity low emissions boilers, zero ODP substances for the production of polyurethane foams, air quality monitoring, low-emission, hybrid and electric vehicles technologies, molten carbonate fuel cell, , white diesel (water diesel emulsion), , “valleranit” (special tilling machinery for optimization of wateruse), farming

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Caribean Risk Management Initiative-UNDP Cuba	MoU	Program designed to build capacity, within the Caribbean region, to address the growing occurrence of natural hazards and environmental risks as well as to emphasize the concept of climate change and social vulnerability.	140.000 USD	Caribbean Countries	
EU-Russia Energy dialogue	Bilateral	Dialogue	EC, Russia	EU, Russia	Energy security and climate change technologies
EU-US Agreement on Climate Change climate-related research cooperation	Plurilateral	Science and technology cooperative research with workshops etc.	EC, US government	EU, USA	Renewables, climate change models and projections, carbon sequestration
EU-India	Bilateral		Funded by European Commission and Member States	EU, India	Energy Efficiency, Renewable Energy, CCS, ITER.
IEA Process Integration	Multi-lateral	Focus on surveying the state-of-the-art in process integration methods, software, & applications & the needs of end-users as a first step towards developing a strategy for further development and implementation of process integration technologies needed in industry	Activities have had both cost-shared and task-shared elements: a common fund has supported the work of the Operating Agent, while participating countries have made task-shared contributions to the products produced by the Operating Agent.	Brazil, Canada, Denmark, Finland, Mexico, Portugal, Sweden,	methodologies developed for system-oriented and integrated approaches to industrial process plant design for both new and retrofit applications
IEA SolarPACES	Multilateral	Collaborative research and implementation projects facilitated by Solar Paces.	Financing from governments of member countries and from other streams such as EU Framework Programmes.	Algeria, Australia, Brazil, Egypt, European Commission, France, Germany, Israel, Mexico, Russian Federation, South Africa, Spain, Switzerland, United Kingdom, United States,	Concentrated Solar Power (CPS) technologies

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IEA Hybrid and Electric Vehicles	Multi-lateral	Information exchange, studies & exploratory research, & evaluations/assessment s to help hybrid and electric vehicle technologies reach their full market potential	informal co-ordination of activities by participants; formal coordination or initiation of activities to achieve shared objectives through shared tasks and information exchange; and formal coordination of activities based on cost sharing	Austria, Belgium, Finland, France, Italy, Japan, Korea (South), Netherlands, Sweden, Switzerland, United States,	hybrid and electric vehicle technologies, including advanced batteries and capacitators
IEA Energy Conservation in Buildings and Community Systems Programme (ECBCS)	Multi-lateral	Administers the Future Buildings Forum & operates the Air Infiltration and Ventilation Centre; task-sharing collaboration between participants	majority of ECBCS' work is conducted through task-sharing in which each country commits resources to the programme	Australia, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Poland, Portugal, Sweden, Switzerland, United Kingdom, United States,	technologies that improve energy efficiency in buildings (e.g. air filtration & ventilation technologies)
IEA Energy Conservation Through Energy Storage	Multi-lateral	Develop and demonstrate various advanced energy storage technologies for application within a variety of energy systems, and to and encourage their use as standard engineering design options	Most of this activity is undertaken through task-shared projects although some cost-shared work is also undertaken.	Belgium, Canada, Denmark, European Commission, Finland, Germany, Italy, Japan, Norway, Spain, Sweden, Turkey, United Kingdom, United States,	energy storage technologies
REN 21 (Renewable Energy Policy Network)	Multi-stakeholder	Global Policy network for promoting policies that will increase the use of renewable energy. REN 21 encourages action on strengthening appropriate policy frameworks and exchanging information	Multi-National	Network consist of governments, international organizations and representatives of civil societies; Governments represented in the steering Committee: Brazil, China, Denmark, European Commission, Germany, India,	Renewable Energy technologies.

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				Morocco, Netherlands, Uganda, United Emirates, UK, US.	
Policy co-operation on Feed-In tariffs for Renewable Energy Sources	Bilateral	Aim of the project is to support the implementation of a feed-in tariff for Renewable Energies in the partner countries. Countries will collaborate by means of exchange of expert knowledge (focus: experiences with the German Renewable Sources Act) with the aim to set appropriate framework conditions. These will help increase the contribution from both electric renewable energy applications and biofuels to the overall energy supply	n.a.	Germany, several partner countries (e.g. African countries)	Renewable Energies
Carbon Sequestration Leadership Forum	Multi-lateral	Information and R&D task-based Agreement between major G8 and transition countries	Support from member states	Brazil, China, Columbia, India, Mexico, South Africa UK, NL,EC...	Carbon separation, capture, transport and storage
International Partnership for a Hydrogen Economy	Multi-lateral	Agreement to accelerate development of FC R&D, technology utilisation, security and economy, Information and Agreement implementation	Support from member states		Mainly developed + China, Brazil, India, Korea
Methane to Markets	Multi-lateral	Non-binding voluntary Agreement for partnerships to develop strategies and markets for methane recovery via R&D, demos, policy frameworks etc.	Support from member states		US, Argentina, Brazil, China, Colombia, India, Italy, Mexico, Nigeria, Ukraine Germany
IEA Greenhouse Gas R&D Programme	Multinational sponsorship	Collaborative R&D research. Information sharing and facilitation of research collaboration	Support from member states budgets	Developed countries and Korea, Venezuela, India	Evaluation of all technologies aimed at reducing GHG
Technology Transfer	Multi-lateral	As part of the Marrakech accord, at COP7, development of a framework to implement Article 4.5.. Expert Group established.	Support from parties to the UNFCCC. Transfer via flexible mechanisms, financing and issuance of CERs		All parties to the UNFCCC

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IEA Enhanced Oil Recovery	Multi-lateral	Group meets once per year to hold a two-day symposium and a one-day workshop	task-shared Agreement without an operating agent or a central budget	Australia, Austria, Canada, Denmark, France, Japan, Norway, Russian Federation, United Kingdom, United States, Venezuela,	enhanced oil recovery technologies (e.g. gas flooding techniques, geological storage of carbon dioxide & emerging technologies)
IEA Energy and Environmental Technologies Information Centres (EETIC)	Multilateral	Umbrella Implementing Agreement, came into being in 1996 with the merger of the Centre for the Analysis and Dissemination of Demonstrated Energy Technologies (CADDET) and the Greenhouse Gas Technology Information Exchange (GREENTIE)	Funded by participant contributions to common funds to operate the Centres themselves. In addition, participants incur costs in preparing and providing data	Canada, Denmark, European Commission, Korea (South), Norway, Sweden,	Energy efficiency and renewable energy technologies, 'clean, technologies', particularly technologies that help mitigate the emissions of greenhouse gases
IEA Advanced Motor Fuels	Multi-lateral	Promote/facilitate understanding of alternative motor fuels & their impacts, facilitate harmonisation	The work programme is conducted through cost-sharing and task-sharing, together with a common fund to support the secretariat and publications	Canada, Denmark, Finland, France, Italy, Japan, Spain, Sweden, Switzerland, United Kingdom, United States,	technologies related to alternative motor fuels either from fossil fuels or from renewable resources
IEA Assessing the Impacts of High-Temperature Superconductivity (HTS) on the Electric Power Sector	Multi-lateral	Exchange of information, e.g. via preparation of essays, fostering debate & action (through workshops & seminars), evaluating & synthesising results, establishing a contacts register, & promoting international cooperation & planning	The work programme is conducted through task sharing together with participant contributions to a common fund to pay for the work of an Operating Agent.	Belgium, Canada, Denmark, Finland, Germany, Israel, Italy, Japan, Korea (South), Netherlands, Norway, Sweden, Switzerland, Turkey, United Kingdom, United States,	high-temperature superconductivity technology
Triangular partnership to facilitate South-South technology transfer, of Brazilian expertise in biofuels. (UK)	Multilateral	Aim to develop sustainable biofuels market in Southern Africa. .	UK funding of key activities	UK, Brazil, South Africa, Mozambique	Biofuels technology

TECHNOLOGY COOPERATION	Nature of Agreement	Nature of cooperation	Financing & available budgets	Country involvement	Technologies covered
EU-China Climate Change Partnership	Bi-lateral	Including joint programme to cooperate on Near Zero Emissions Coal (NZEC). This entails research, development and deployment of clean coal and carbon capture and storage (CCS).	7 MEUR (including 3.5 M£)	EU, China	Action to develop and demonstrate near zero emission coal technologies, energy efficiency, energy conservation, and new and renewable energy; hydrogen and fuel cells; power generation and transmission.
FEV lines (Financing Feasibility Studies)	Bilateral	Financing Feasibility studies targeted to promote low carbon technologies			Projects based on low carbon technologies: renewable energy, energy efficiency
ICEX (Institute of Foreign Trade)	Multilateral	Export Plan of High Technology Industry ("Plan de Exportación de alto contenido tecnológico") that promotes technology transfer of Spanish companies in sectors with high technology content, especially energy-based projects.		Spain and China, Brazil, India and others.	Waste, management, renewable energy, electric generation, energy efficiency
ICEX (Institute of Foreign Trade)	Multilateral	Export Plan of High Technology Industry ("Plan de Exportación de alto contenido tecnológico") that promotes technology transfer of Spanish companies in sectors with high technology content, especially energy-based projects.		Spain and China, Brazil, India and others.	Waste management, renewable energy, electric generation, energy efficiency
IEA Advanced Fuel Cells	Multi-lateral	Task shared agreement. Primarily information exchange on fuel cell science, technology and markets through Annex meetings and workshops.		Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Korea (South), Netherlands, Norway, Sweden, Switzerland, United Kingdom, United States,	Molten Carbonate, Solid Oxide and Polymer Electrolyte Fuel Cells. Fuel cell systems for stationary, mobile and portable applications.

TECHNOLOGY COOPERATION	Nature of Agreement	Nature of cooperation	Financing & available budgets	Country involvement	Technologies covered
IEA Advanced Materials for Transportation	Multi-lateral	Task sharing and exchange of information between participants, including work on standardisation		Belgium, Canada, Germany, Japan, Sweden, United States,	advanced materials for transportation (e.g. Ceramics for Advanced Heat Engines and other Conservation Applications, Materials for Diesel Engines)
IEA Bioenergy	Multi-lateral	IEA-member country representation. Task-sharing and Agreement implementation		Australia, Austria, Belgium, Brazil, Canada, Croatia, Denmark, European Commission, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, South Africa, Sweden, Switzerland, United Kingdom, United States,	
IEA Clean Coal Centre London	Multi-national sponsorship	Information resource network on clean coal and clean coal technologies R&D and collaboration.		Only through private sector sponsorship; India, South Africa, China	Coal and associated clean coal technologies
IEA Clean Coal Sciences	Multi-lateral	IEA-member country representation. Share and develop coal combustion technology		Australia, Canada, Denmark, Finland, Germany, Italy ,Japan, Mexic o, Netherlands, South Africa, Sweden, Unite d Kingdom, United States,	science of coal combustion, conversion and utilization; co-firing and bio-co-processing
IEA Climate Technology Initiative (CTI)	Multi-lateral	Technology transfer - IEA implementing Agreement in 2003. Participants implement a broad range of cooperative activities in partnership with developing and transition countries, the UNFCCC and, in particular, the Expert Group on Technology Transfer (EGTT), relevant IEA		Austria, Canada, Finland, Germany, Japan, Norway, South Korea, United Kingdom, United States, Sweden	climate-friendly and environmentall y sound technologies and practices

TECHNOLOGY COOPERATION	Nature of Agreement	Nature of cooperation	Financing & available budgets	Country involvement	Technologies covered
		Implementing Agreements and other international organizations or initiatives			
IEA Demand-Side Management	Multi-lateral	Information exchange, co-operative support for development and demonstration of DSM technologies, and helping ensure optimal implementation & value for customers		Australia, Austria, Belgium, Canada, Denmark, Finland, France, Greece, Italy, Japan, Korea (South), Netherlands, Norway, Spain, Sweden, United Kingdom, United States,	demand-side management technologies (e.g. flexible gateway technology)
IEA District Heating and Cooling	Multi-lateral			Canada, Denmark, Finland, Germany, Korea (South), Netherlands, Norway, Sweden, United Kingdom, United States,	District heating and cooling technologies, including CHP
IEA Energy Conservation and Emissions Reduction in Combustion	Multi-lateral	Task-sharing and information exchange between participants and collaborative work at each others' facilities		Belgium, Canada, Finland, Germany, Italy, Japan, Norway, Sweden, Switzerland, United Kingdom, United States,	combustion efficiency technologies
IEA Fluidized Bed Conversion	Multi-lateral	Brings together experts wishing to work on common problems, particularly through technical exchanges during meetings and workshops		Austria, Canada, Czech Republic, Finland, France, Greece, Italy, Japan, Korea (South), Portugal, Spain, Sweden, United Kingdom,	fluidized bed conversion technologies
IEA Fusion Materials	Multi-lateral	Collaboration on developing and testing materials suitable for fusion reactors and components		Canada, China, European Commission, Japan, Russian Federation, Switzerland, United States,	fusion reactor and component technologies

TECHNOLOGY COOPERATION	Nature of Agreement	Nature of cooperation	Financing & available budgets	Country involvement	Technologies covered
IEA Geothermal	Multi-lateral	Exchange of information, common development of new technologies, and disseminating information on the environmental advantages of geothermal energy		Australia, European Commission, Germany, Iceland, Italy, Japan, Korea (South), Mexico, New Zealand, Switzerland, United States,	geothermal energy technologies (e.g. technologies for commercial heat extraction)
IEA Heat Pumping Technologies	Multi-lateral	Executes a broad range of activities: the Heat Pump Centre (an information service), collaborative international projects, workshops, analysis studies and a triennial international conference		Austria, Canada, France, Germany, Japan, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom, United States,	heat pumping technologies
IEA Hydrogen	Multi-lateral	Development of advanced technologies; database of metal hydride material properties has been produced		Australia, Canada, European Commission, Iceland, Italy, Japan, Lithuania, Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States,	advanced hydrogen technologies, including direct solar production systems and low-temperature metal hydrides and room-temperature carbon nanostructures for storage
IEA Hydropower	Multi-lateral	Working group of governments and industry which intends to provide objective, balanced information about the advantages and disadvantages of hydropower		Canada, China, Finland, France, Italy, Japan, Norway, Sweden, United Kingdom	hydropower technologies
IEA Nuclear Technology of Fusion Reactors	Multi-lateral	Formulation & co-ordination of R&D programmes, conduction of experiments		Canada, European Commission, Japan, Russian Federation, United States,	focuses on the first wall, blanket, shield and plasma-facing components of the fusion reactors
IEA Ocean Energy Systems	Multi-lateral	Promotion of research, development, demonstration & information exchange & dissemination, to lead to the deployment & commercialisation of Ocean Energy Technologies		Canada, Denmark, European, Commission, Ireland, Japan, Portugal, United Kingdom,	ocean energy technologies, especially those related to ocean waves and marine current systems

TECHNOLOGY COOPERATION	Nature of Agreement	Nature of cooperation	Financing & available budgets	Country involvement	Technologies covered
IEA Photovoltaic Power Systems	Multi-lateral	Collaborative R&D Agreement conducting projects on the application of solar photovoltaic electricity that operates worldwide via a network of national teams in member countries		Australia, Austria, Canada, Denmark, European Commission, Finland, France, Germany, Israel, Italy, Japan, Korea (South), Mexico, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States,	photovoltaic technologies
IEA Plasma Wall Interaction in TEXTOR	Multi-lateral	Based on a particularly strong and valuable collaboration between Canada, EURATOM, Japan and the United States		Canada, European Commission, Japan, United States,	TEXTOR technologies (e.g. boronisation techniques, edge radiation cooling)
IEA Solar Heating and Cooling	Multi-lateral	Collaborative R&D programme monitored by an Executive Committee consisting of one representative from each of the 20 member countries and the European Commission		Australia, Austria, Belgium, Canada, Denmark, European Commission, Finland, France, Germany, Italy, Mexico, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States, Algeria, Australia, Brazil, Egypt, European	active solar, passive solar and Concentrated Solar Power (CPS) technologies
IEA Stellarator Concept	Multi-lateral	co-ordinates all ongoing Stellarator activities globally in one co-ordinated programme, including mechanisms to jointly investigate the properties of different Stellarator approaches and to compare them with the tokamak concept		Australia, European Commission, Japan, Russian Federation, Ukraine, United States,	Stellarator technologies

TECHNOLOGY COOPERATION	Nature of Agreement	Nature of cooperation	Financing & available budgets	Country involvement	Technologies covered
IEA Toroidal Physics in, and Plasma Technologies of Tokamaks with Poloidal Field Divertors (ASDEX-Upgrade)	Multi-lateral	co-operative activity is concentrated on plasma shape and position control, plasma disruptions, vertical displacement and tokamak edge modelling		European Commission, Korea (South), United States,	toroidal physics and plasma technologies in tokamaks with poloidal divertors
IEA Wind Energy Systems	Multi-lateral	stimulation of co-operation on wind energy research and development and provision of high quality information and analysis to member governments and commercial sector leaders		Australia, Austria, Canada, Denmark, European Commission, Finland, Germany, Greece, Ireland, Italy, Japan, Korea (South), Mexico, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States,	wind energy technologies
EU Energy Facility	Multilateral	Significant focus on sustainable energy solutions for poverty alleviations	220 MEUR (Not counting private investment)	African, Caribbean and Pacific countries	Renewable energy/energy efficiency technologies.
GEEREF	Multilateral	Global Energy Efficiency Renewable Energy Fund	80 MEUR	DC and EIT	Renewable energy/energy efficiency technologies.
EIB Climate Change Facility	Multilateral	Long-term loan finance to companies operating outside the EU developing JI and CDM projects	100 MEUR	JI and CDM eligible countries	
EIB Climate Change Technical Assistance Facility	Multilateral	Advance funding for activities associated with the development of project-based carbon assets CDM and JI.	5 MEUR	JI and CDM eligible countries	
Renewable Energy and Energy Efficiency Partnerships (REEEP)	Pluri-lateral	Global; Policy / regulatory / financing projects to create markets for clean energy and funding facilities		UK, AT/IR/IT, EU Commission	
Mediterranean Renewable Energy Programme (MEDREP)	Multi-lateral	Type II partnership launched by the Italian Ministry for the Environment at the Johannesburg World Summit in 2002. The two principal objectives of MEDREP are: providing sustainable energy services; and contributing to the	IT is a major donor	Mediterranean countries	Renewable energies, energy efficiency

TECHNOLOGY COOPERATION	Nature of Agreement	Nature of cooperation	Financing & available budgets	Country involvement	Technologies covered
		climate change mitigation by increasing the share of renewable energy in the energy mix of the Mediterranean Region. The programme includes several bilateral initiatives with Mediterranean countries on the deployment of renewable energy and energy efficiency technologies.			
EU-China Energy and Environment Programme	Bi-lateral	Focal areas include energy policies, energy efficiency, renewable energies, and natural gas also in the context of climate change policies.	€20 million (2003-2008)		
COOPENER		Capacity building to develop clean energy policies at national and regional level.	€ 5 million (2007-)		
Global Network on Energy for Sustainable Development (GNESD)	Multi-lateral	A Johannesburg initiative to support promotion of sustainable energy		Denmark, Germany, Italy	
The Dutch Program on Climate and Sustainable Energy	Multiple	E.g. Development of sustainability criteria for large scale biomass production; Sustainable energy supply in the African Great Lakes Region; general access to clean energy in Sub Sahara Africa and South East Asia through (CEIF).	€ 500 million (2008-2011)	Netherlands	
Examples of projects under the environment theme of the EC Research FP6 and FP7	Multilateral				
TETRIS		Technology Transfer and Investment Risk in International Emission Trading	€ 0.7 million (2005-2006)	CH, NL, UK, CZ, EC	Mainly energy technologies
ADAM		Adaptation and Mitigation Strategies: Supporting European Climate Policy	€ 12.9 million (2006-2009)	ES, NO, BE, China, UK, HU, EC, FR, CH, AT, SE, NL, PL, DE, India, IT	
GAINS-ASIA		Greenhouse Gas and Air Pollution Interactions and Synergies	€ 0,695 million (2005-2008)	China, India, and 43 European countries including Russia.	
TOCSIN		Technology-Oriented Cooperation and Strategies in India and China: Reinforcing the EU dialogue with Developing Countries on Climate Change	€ 1.07 million (2007-2009)	EU, China, India	Technologies in power generation, transport, agriculture, and heavy industry

TECHNOLOGY COOPERATION	Nature of Agreement	Nature of cooperation	Financing & available budgets	Country involvement	Technologies covered
ClimateCost		Mitigation Full Costs of Climate Change	€ 3.5 million (2009-2011)		
HighNoon		Impacts of Himalayan glaciers retreat and monsoon pattern change on the water resources in Northern India, and adaptation strategies	€ 3.3 million	FR, UK, EL, China, DK, DE, IE, AT, IT, BE, India, ES	Adaptation
AQUAREHAB		Rehabilitation technologies for degraded water systems presenting quantity and quality problems	€ 6.6 million	India	Water management technologies
Climate for Culture		Development and application of methodologies, technologies models and tools for damage assessment, monitoring and adaptation to climate change impacts	€ 4.9 million		Technologies for damage assessment, monitoring and adaptation
CEOP-AEGIS		Improving observing systems for water resource management	€ 3.4 million		Water management technologies
Finland's Energy and Environment Partnership with Central America	Bi-lateral	The Energy and Environment Partnership with Central America is an initiative launched by the Ministry for Foreign Affairs of Finland, SG-SICA and CCAD during the World Summit in Johannesburg 2002, and the participants are governmental entities and private institutions.	€ 3 million (2003-2006) € 4 million (2006-2009)		
The International Environmental Transformation Fund (UK)		Support development and poverty reduction through environmental protection. Finance for low carbon technologies to provide access to clean energy in developing countries, and provide assistance with adaptation to climate change and tackling deforestation	€ 1,1 billion (2008-2011)	UK	
Support for the promotion of technological development in Serbia and Montenegro (Poland)	Bilateral	Granting a preferential credit under a combined assistance scheme for Serbia and Montenegro	23 M USD	Poland, Serbia, Montenegro	Projects for the energy and mining sectors
Support for the promotion of technological development in China (Poland)	Bilateral	Granting a preferential credit under a combined assistance scheme for China	3,9 M USD	Poland, China	Projects on environmental protection, as well as on health

TECHNOLOGY COOPERATION	Nature of Agreement	Nature of cooperation	Financing & available budgets	Country involvement	Technologies covered
					protection, education, infrastructure, communicatio n and mining
UK contribution to the Clean Energy Investment Frameworks (CEIFs)	Multilateral	To support the Multilateral Development Banks to accelerate public and private investments in clean energy	Approximately 30 MEUR since 2005	The MDBs cover all countries and regions of the world and support both middle and low income countries.	Clean Energy Technologies
Agreements for CDM/JI projects (France - Foreign affairs ministry)	Bilateral	Bilateral agreements		15 countries (LDCs and emerging countries)	Technology-related sectors developed by French companies
Agreements and working groups on energy cooperation (France - Foreign affairs ministry)	Bilateral	Bilateral agreements		6 emerging countries	Energy
France FASEP (Finance ministry) Technical assistance for project preparation (feasibility studies, preliminary design, detailed design)	Bilateral	Programs for climate change	€4 millions per year	Developing countries	Water, waste, energy, transport, support to CDM/JI projects
France (AFD – Agence française de développement)	Bilateral	Programs for climate change	€455 millions for 2008 (prevision: €2,5 billions in the next 3 years)	73% in Priority Solidarity Zone	Energy sector 83%, urban planning 6%, forestry 2%
Fonds Français pour l'environnement Mondial (FFEM)	Bilateral	Programs for climate change	€6 millions/year	Africa/Mediter ranee (20M€): 17 projects ; LAC (3,3M€): 3 projects ; AP: (10M€): 6 projects ; East Eur. (5M€): 4 projects	Energy, forestry, agriculture, adaptation
France, National research and energy agencies (IRD, CIRAD)		Programs for climate change	€8 millions/year	Africa, LAC, AP, Middle East	Agriculture, forestry, energy, health, adaptation, knowledge sharing, training
France, National energy agency (ADEME)		Programs for climate change	€2 millions/year	Maldives, Algeria, India China, Mediterranean basin Equator, Marocco, Sub-Saharan Africa	Energy
France (Ministry of Foreign Affairs) / IEPF (Francophony)	Bilateral	Program	2 M€ project 2008-2010	African countries	Sector-based studies in six different

TECHNOLOGY COOPERATION	Nature of Agreement	Nature of cooperation	Financing & available budgets	Country involvement	Technologies covered
Program NECTAR (Négociations Climat Toute l'Afrique Renforcée)					sectors: physical planning and building; agriculture; forests; energy; water and sanitation, transport and telecommunications
France (Ministry of Foreign Affairs) / ACMAD (African Centre of Meteorological Application for Development) Program VigiRisC (Vigilance face au risque climat en Afrique)	Bilateral	Program	4 M€ over 3 years starting in 2008	African countries	"Early warning" products: vulnerability maps, meteorological forecasts at all time scales, historical data zoning (flow, rain….)
France (Ministry of Foreign Affairs) / ECOWAS (Economic Community of West African States)	Bilateral	Program AOC (Adaptation to climate change in water and agricultural sectors in western Africa)	1,5M€ 2009-2011	Western Africa	Policies and sectoral programmes (water , agriculture)
France (Ministry of Foreign Affairs) / Island States from the south west part of the Indian Ocean Program IOC	Bilateral	Program IOC	1,7M€ 2008-2010	Madagascar, Mauritius, Seychelles, Comoros, Réunion Island –(France-)	Observation and comprehension ; Climate change effects assessment and analysis (vulnerability assessment); Extreme event warning systems and risks prevision plans
METEO France / WMO Caribbean/HYCOS Program	Bilateral	Program		Caribbean countries	Climate observation
METEO France / ACMAD (African Centre of Meteorological Application for Development) Program AMMA	Multilateral	Program		African countries	Climate observation and adaptation
France (AFD – Agence française de développement) Observation program for forestry in Africa	Bitaleral	Study on a satellite reception observatory for forest management		Central Africa / Congo Basin	Forestry
France (AFD – Agence française de développement) / Japan Climate Change Policy Loan	Bilateral	Support program to the National Council on Climate Change (NCCC)	200M€ (2008)	Indonesia	Forestry, energy, water, agriculture, land planning, CDM development
France (AFD – Agence française de développement) National agro-ecology program	Bilateral	Program	€15 millions	Madagascar	Agriculture

TECHNOLOGY COOPERATION	Nature of Agreement	Nature of cooperation	Financing & available budgets	Country involvement	Technologies covered
Clean Technology Fund (CTF), as part of Climate Investment Funds (CIF)	Multilateral	Demonstration, deployment and transfer of low carbon technologies	*Pledged amounts by EU member states (2008-2012):* France: € 203 million Germany: € 550 million Netherlands: US$50 million Spain : € 80 million Sweden : SEK 600 million UK: GBP 800 million (to the World Bank funds. The major portion of this will go to the CTF).	Country access will be based on: ODA-eligibility and an active MDB country program	Low-carbon technologies with a significant potential for long-term GHG emissions savings
ITER	Plurilateral	Fusion technology development based around a hydrogen plasma torus which will produce 500 MW of fusion power		China, the EU and Switzerland (Euratom), Japan, Korea, the Russian Federation, and the USA, under the auspices of the IAEA.	

PAPER NO. 7: GRENADA ON BEHALF OF THE ALLIANCE OF SMALL ISLAND STATES

Submission by Grenada on behalf of the Alliance of Small Island States (AOSIS) Effectiveness of Article 4, paragraph 1(c) and 5 of the Convention on the Development and Transfer of Technology

Grenada welcomes the opportunity to present the views of the 43 member States of the Alliance of Small Island States (AOSIS), in response to the request for views of Parties on the effectiveness of Article 4, paragraph 1(c) and 5 of the Convention on the Development and Transfer of Technology.

Introduction

The Fourteenth Conference of the Parties (COP 14) of the United Nations Framework Convention on Climate Change (UNFCCC) invited Parties and relevant organizations to make submissions to the UNFCCC Secretariat by 16 February 2009, in accordance with paragraph 9 of the Terms of Reference for the Review and Assessment of the Effectiveness of the Implementation of Article 4, paragraphs 1 (c) and 5 of the Convention as contained in the annex to document FCCC/SBI/2008/L.28.

The submissions should be based on the following five areas of focus.

Areas of Focus

(a) Review the extent to which actions have promoted and supported institutional systems and regulatory and legislative frameworks needed to scale up development and transfer of technologies.

The UNFCCC entered into force in 1992. It is estimated that it takes approximately ten years after a new technology has been developed and deployed for it to have any significant impact in a sector. In the 15 years since the Convention has come into force, global emissions of greenhouse gases have increased significantly. Therefore, it is difficult to see how any of the actions taken so far have scaled up the development and transfer of technology. If indeed institutional systems had been promoted and supported and regulatory and legislative frameworks had been adopted to promote the development and transfer of technology then the effects of such actions would have resulted in significant deployment of more energy efficient technologies in all sectors.

The ineffectiveness of such actions is even more evident for technologies for adaptation. The impacts of climate change are more evident with each passing day. If the actions taken were having any impact, then there would be less negative impacts.

(b) Review the range of practical actions taken and identify possible actions to promote innovative public and/or private partnerships and cooperation with the private sector and consider steps that governments, the business sector and academia can take to facilitate effective participation by the private sector.

Some innovative actions have been undertaken especially through the Expert Group Technology Transfer (EGTT) to develop mechanisms like PFAN which encourage private financial entities to develop and invest in technology transfer projects. However, these activities are occurring on a very limited basis and must be expanded significantly if they are to have any impact.

Many non-Annex I Parties have conducted their Technology Needs Assessments (TNAs) which contain concepts and project ideas to enhance the development and transfer of technologies within their countries. Mechanisms should be developed and implemented so that these can be circulated to

the private sector and academia in both developed and developing countries to encourage partnerships to stimulate the development and transfer of technologies.

(c) Review the mechanisms and processes developed to enhance cooperation with relevant intergovernmental processes.

The intergovernmental processes that have promoted the development and transfer of technology are the United Nations Development Programme (UNDP) through the production of the TNA manuals, the Global Environmental Facility for the funding of projects to develop TNAs, and the United Nations Industrial Development Organization (UNIDO) through its organization of workshops on developing fundable technology transfer projects. While these initiatives are laudable, they have not made any significant impact on the wide scale implementation of technology transfer projects.

(d) Review efforts to promote collaborative research and development on and deployment of technologies for mitigation and adaptation.

Efforts in this area have been very limited especially in the Caribbean. While there may have been or there is interest for such initiatives in both developed and developing countries there is no process to facilitate the exchange of interest. Such a mechanism must be developed.

(e) Review the adequacy and timeliness of the financial support provided, within the context of Article 4, paragraphs 1(c) and 5, for the purposes of development and transfer of technologies, the related activities and their results.

To date funding has been provided to developing countries to prepare their TNAs through a "top-up" facility of the GEF. Those Parties which did not access that facility were given another opportunity to do so while preparing their project proposals for their Second National Communications. A new revised manual on preparation of TNAs is being prepared by the UNDP. Funding may become available to enable developing countries to update or prepare their TNAs using these new methodologies. Funding for activities for concrete activities for the development and transfer of technologies is limited. The only funding that has been provided so far is that provided for mitigation projects funded by the GEF. There has been even less for adaptation projects. There must be significantly more financial support provided to support the development and transfer of technology.

PAPER NO. 8: JAPAN

Japan's submission on development and transfer of technologies (SBI)

- The private sector leads technology research and development and owns various climate-friendly technologies as the fruits of its efforts. Basically technology transfer is well under way on a commercial basis, and in some sectors, developing countries such as China and India are leading the world.

- Therefore, improvement of environment to facilitate these activities on a commercial basis is the most effective and efficient way to realize further technology transfer.

- There are wide ranges of technologies to address climate change. It is crucial to identify appropriate technologies, analyze the actual conditions and barriers in each sector and take appropriate measures including legal systems on environment and energy, and business environment to accelerate technology transfer on a commercial basis, in cooperation between developed and developing countries, rather than treating wide ranges of technologies inclusively.
- Japan would like to explain in this submission, the efforts and achievements Japan has made based on these ideas.

1. Actions for institutional systems, regulatory and legislative frameworks

(1) Exchange of policy information through bilateral dialogue
- Japan has promoted international cooperation with developing countries, considering the respective conditions of the host countries such as energy demand, effects on Japan's economic and energy policies, current efforts for energy conservation, and urgency in their environmental policies.
- Japan has been conducting bilateral dialogues with developing countries in Asia to improve energy efficiency in the host countries by sharing energy conservation policies, supporting effective systems including human resources development, model projects, and business support for energy conservation and renewable energy.
  - Ministerial meetings with China and India
  - Administrator meetings with Thailand, Malaysia, Indonesia, Vietnam, and Philippines

(2) Support for human resources
- Japan has promoted acceptance of trainees and dispatch of experts, and committed, at the 2nd East Asia Summit in January 2007, to accept 1,000 trainees from East Asian countries and dispatch 500 experts in five years.
  - Acceptance of trainees who learn legal systems and policies (e.g. tax systems, subsidy programs), management systems, and technologies to promote energy conservation and renewable energy.
  - Long-term dispatch of experts for development of energy conservation legal systems such as energy conservation law, and short-term dispatch of experts for energy-saving diagnoses of factories

2. Actions to promote public and/or private partnerships

(Existing activities)

(1) Public-private fora

- Promote active involvement of private sectors which own technologies through, inter alia, bilateral public-private fora including ministers.

（China）

- Japan-China Forum on Energy Conservation and Environment (May 2006, September 2007, and November 2008. The forth forum is to be held in China in 2009)

（India）

- Japan-India Energy Forum (December 2006 and February 2008)

(2) Asia-Pacific Partnership on Clean Development and Climate (APP)

- The APP is a public-private partnership among major greenhouse gas (GHG) emitting countries in the Asia-Pacific region. The APP promotes various activities for efficient GHG reductions in the region through the development, diffusion, deployment and transfer of cost-effective, cleaner technologies and practices. The activities under the APP are consistent with the UNFCCC and complement, but do not replace, the Kyoto Protocol. Partner countries, namely Australia, Canada, China, India, Japan, South Korea, and the United States accounted for about 54% of the world's CO2 emissions in 2005 (Source: the IEA, "CO2 emissions from fuel combustions").
- Partners work on activities in eight key sectors by Task Forces (TF) - Aluminum, Buildings and Appliances, Cement, Cleaner Fossil Energy, Coal Mining, Power Generation and Transmission, Renewable Energy and Distributed Generation, Steel. (Japan has been serving as Chair of the steel TF and cement TF since their inception.)
- The steel TF identified 64 best available technologies and practices on clean technologies, and estimated the potential CO2 reductions of 127 million tons per year if those 10 most important key technologies are implemented in full by the 6 partner countries, and publicized compilation of the 64 best available technologies and practices on clean technologies as "the State-of-the-Art Clean Technologies (SOACT) for Steelmaking Handbook[1]". The steel TF is also in the process of collecting and analyzing the environmental performance data such as energy consumption from seven partner countries based on the agreed common boundaries, and started the discussion for voluntary target setting. Furthermore, to support these activities, the "performance diagnosis" projects, which dispatch the experts to the plants to give advice on energy efficiency and environmental matters, were carried out in China and India. One of the Chinese plants has adopted recommended facilities based on the diagnosis.
- The cement TF launched the "Center of Excellence" project in China for workers' capacity-building on energy and environmental management such as GHG protocol training, and is in the process of collecting and analyzing the energy and environmental performance data and CO2 reduction potential. The "performance diagnosis" projects were carried out three plants each in China and India during FY2007-2008.

(3) International projects for increasing the efficient use of energy

- In order to disseminate the technologies especially in the energy intensive sectors in developing countries, the Japanese government has supported the introduction and demonstration of the effectiveness of energy efficient technologies that are already commercialized in Japan in developing countries, under "International projects for increasing the efficient use of energy" conducted by the New Energy and Industrial Technology Development Organization (NEDO).
- The model projects consist of three phases; feasibility studies for model projects, model projects, and follow-up activities for dissemination

[1] http://asiapacificpartnership.org/pdf/Projects/Steel/SOACT-1-7-08.pdf

- Feasibility studies are conducted to explore the potential for project implementation. Consultations are held with governmental bodies and candidate implementation sites in the host countries.
- If the results of the feasibility study are favorable, energy efficient technologies already commercialized in Japan are introduced in an energy-intensive industrial facility in the host countries. After installation, the effectiveness of the introduced technologies is demonstrated to promote their establishment and dissemination in the host country as model project.
- Based on the results of the model project, follow-up activities are to be conducted to support the dissemination of the introduced technologies by dispatching Japanese technical experts to the host country to provide training and technical guidance.

o 36 model projects were conducted between FY 1994 and FY2006, and it is confirmed that 13 of them contributed to the dissemination of the technologies to at least 130 plants in developing countries. The total CO2 reduction potential of the 130 plants is estimated as 8 million tons-CO2 per year. Typical examples are:

- Heat recovery power generation systems in the cement sector to 50 plants
- Coke dry quenching technology in the steel and iron sector to 33plants

o NEDO also publicizes a compilation[2] of Japanese technologies for energy savings and GHG emissions reduction to support energy-saving activities.

(4) "Japanese business alliance for smart energy worldwide"

o In order to contribute to realize global low carbon societies by disseminating energy conservation and renewable technologies accumulated by Japan's industry, developing a joint government-industry framework is indispensable. In this circumstance, Japan's business community gathered together and established the "Japanese Business Alliance for Smart Energy Worldwide[3]" in October 2008.

o The alliance plans to formulate "Compilation of Japanese products and technologies in the area of energy efficiency and renewable energy" to accelerate the dissemination of energy-saving technologies globally.

(5) Co-benefits CDM pilot project

o Japan has implemented co-benefits pilot projects which simultaneously contribute to the urgent needs of environmental pollution control and mitigation of climate change in developing countries

o These projects promote to transfer "co-benefits technologies" under the CDM scheme, through financial support to Japanese private companies

o The Japanese government adopted the following pilot projects in Malaysia and Thailand in 2008.

- Reduction of methane gas emissions and early environmental improvement at Pulau Burung landfill site (Malaysia)
- Biogas from ethanol wastewater for electricity generation (Thailand)

o In future, Japan will promote public and/or private partnerships to implement these co-benefits projects. Therefore, Japan is currently proposing the idea to allow preferential treatments for CDM projects with specific co-benefits.

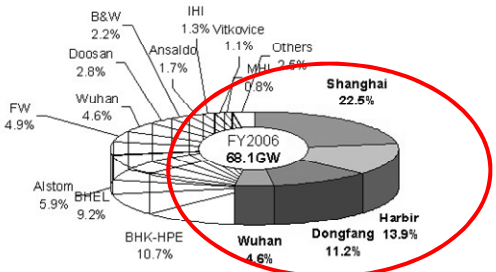
（Future actions）

(1) Current situation of technology transfer

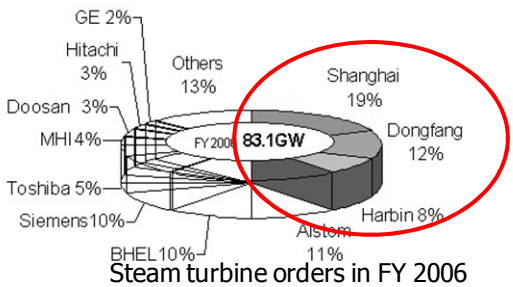
o The private sector has developed and owns most of Japan's climate-friendly / environmentally-sound technologies, and technology transfer is already well under way on a commercial basis

[2] http://www.nedo.go.jp/library/globalwarming/ondan-e.pdf
[3] http://www.jase-w.eccj.or.jp/eng/index.html

in various forms such as product exports, joint ventures, and licensing. In some sectors, developing countries such as China and India have already reached an advanced stage to lead the world. Therefore, improvement of environment to facilitate these activities on a commercial basis is the most effective and efficient way to realize further technology transfer.



Conventional boiler orders in FY 2006
(Source: Mitsubishi Heavy Industries)



Steam turbine orders in FY 2006
(Source: Mitsubishi Heavy Industries)

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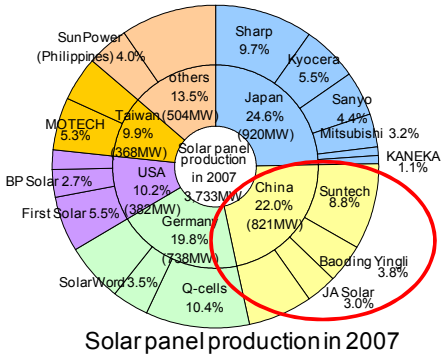


Solar panel production in 2007
(Source: PV News 2008.3)

(2) Identification of relevant technologies and actions on sectoral basis

- The actual patterns of technology transfer vary from sector to sector and from country to country, due to differences in the needs on the supply and demand sides, business circumstances, social systems, and other factors. For instance, different countries have different circumstances and we have to consider such difference to promote technology transfer more effectively and efficiently.
- In order to accelerate technology transfer, it is necessary to analyze the actual conditions and barriers in each sector. Based on this analysis, comprehensive solutions to accelerate actions by both the public and the private sector on the supply and demand sides should be formulated. Enhancing the enabling business environment in host countries including the establishment of legal systems such as proper intellectual property rights (IPRs) protection and proper legal systems on energy and environment is important to promote technology transfer on a commercial basis.

(3) Support by advisory group for sectoral technology cooperation

- An advisory group for sectoral technology cooperation should be established in order to support mitigation actions taken by developing country Parties, by removing the barriers and promoting technology transfer and diffusion by sectors. The advisory group should include relevant experts (academia and international organization such as IEA) and industrial communities (e.g. international industrial associations).
- With a view to supporting the mitigation actions taken by developing country Parties, this advisory group aims to, inter alia, identify necessary technologies which are currently available and will be available in the future, to analyze appropriate ways for promoting the transfer of existing technologies, and to analyze the emission reduction potentials. The result of the

examination by this advisory group will be utilized to assist technology transfer under the financial mechanism. It will also give advice for promoting technology transfer and diffusion in each sector, and makes a periodic report to the COP on its activities.

(4) Proper protection of intellectual property rights (IPRs)
- o IPRs are fundamental tools to recoup research and development (R&D) investments, strong incentives for further technology transfer, and main sources of business competitiveness and profit.
- o In this regard, it is necessary to improve the business environment including proper protection of IPRs, with a view to promoting sustainable development of technologies by the private sector.

(5) Promotion of a co-benefits approach
- o For further achievement of sustainable development by tackling the urgent issue of environmental pollution in many developing countries, "co-benefits technologies" which simultaneously address both environmental pollution specific to air and water pollution, and waste problems whose direct effects are measurable, reportable, and verifiable (MRV) and climate change should be actively transferred.
- o To promote transfer of "co-benefits technologies", research and development of "co-benefits technologies", further implementation of co-benefits CDM projects and priorities on co-benefits CDM projects are essential.

3. Cooperation to promote relevant intergovernmental processes

(1) Asia-Pacific Partnership on Clean Development and Climate (APP) (described previously)

(2) Cool Earth Partnership
- o Japan launched the so-called "Cool Earth Partnership" in January 2008 which would make on the scale of US$ 10 billion available for the five year period from 2008 to 2012 in order to assist developing countries making efforts in reducing GHG emissions and achieving economic growth in a compatible way.
- o Such assistance includes mitigation, adaptation and access to clean energy through the official development assistance (ODA) and other official flows. Examples of the concrete scope of the programs include disaster prevention, electrification of rural communities by solar power generation and small-scale hydro energy, forest conservation and improving energy efficiency of electric power plants.
- o Developing countries can make the transition directly to "low-carbon society" while maintaining high economic growth through the bold introduction of advanced technologies for energy conservation and low-carbon energies.
- o Assistance in new energy development and improvement of the efficiency of old coal power plants is an example of Japanese technology transfer to developing countries. Another form of assistance is training programs (the Cool Earth Partnership Seminar) which will start in April 2009 in order for experts of developing countries to understand phenomena of climate change and acquire knowledge and skills in the sphere of countermeasures for climate change including energy conservation technologies.

(3) Bilateral cooperation for a co-benefit approach
- o The Japanese government concluded agreements on cooperation through a co-benefits approach with China and Indonesia respectively in December 2007
  - • Agreement on cooperation in co-benefits research and pilot project／China
  - • Joint statement on environmental protection through a co-benefits approach／Indonesia

- The Japanese government is currently conducting researches to develop co-benefits projects based on these agreements.
- A co-benefits approach is also discussed in the "Asia-Pacific Seminar on Climate Change" which provides opportunities to exchange information and view on issues of climate change. In future, exchange of information on a co-benefits approach should be promoted multilaterally as well as bilaterally.

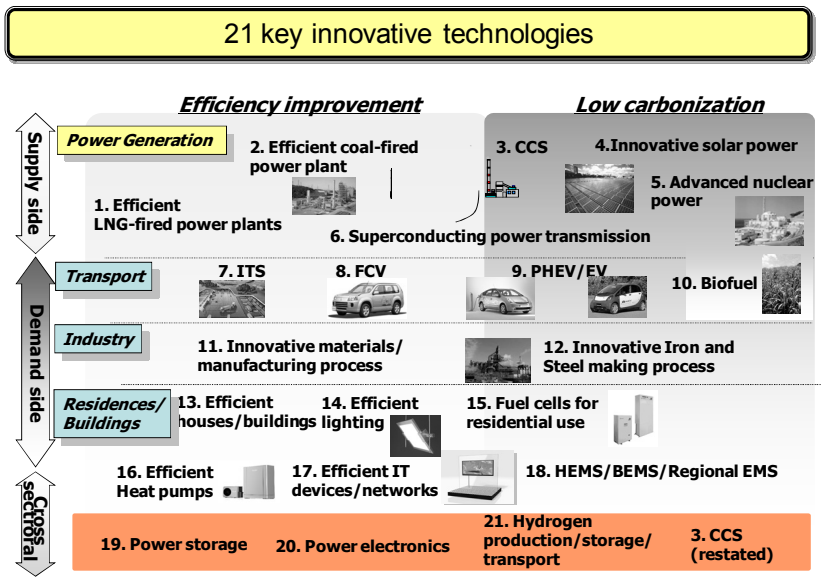
(4) International Partnership for Energy Efficiency Cooperation (IPEEC)
- The IPEEC is an international cooperative framework to support efforts for improving energy efficiency, through information exchange on energy policy systems and best practices. At the G8, the China, India and Korea Energy Ministerial Meeting in Aomori in June 2008, those countries decided to establish this Partnership.
- The basic framework and time schedule for the establishment of the IPEEC were decided at the IPEEC ministerial meeting in December 2008.
- Participants of the IPEEC include the major economies such as China and India can. The participating countries will consider the concrete projects.

4. Collaboration for Research, Development and deployment of technologies

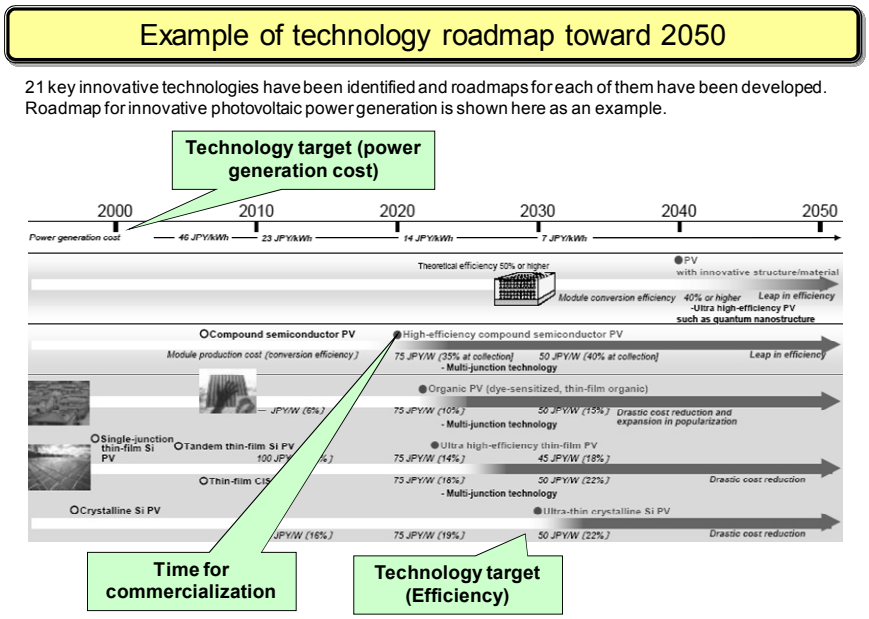
(1) Implementing agreement by the IEA
- The implementing agreement is the framework of which IEA member countries can make use, in order to exchange information about their experiences and technologies to promote the clean and efficient use of fossil fuels, to improve energy efficiency, to develop and disseminate renewable energy and innovative energy technologies such as nuclear fusion, and to improve energy security.
- 76 implementing agreements have been established since the IEA was founded in 1974, and 42 of these are now active. Japan participates in 29 implementing agreements and is the third most active contributor, following the United States and Canada.
- The IEA has opened the door of the implementing agreement to non-IEA member countries, such as China, India, and Russia, since 2003 to promote active involvement of major economies. The numbers of implementing agreements some of the major economies participate are; six for China, four for India, six for Russia, five for Brazil, eleven for Mexico, and six for South Africa.

(2) International technology roadmaps
- Since innovative technology development requires a large investment over a long period of time, it is important for each county to share an understanding for the future direction of technology development and promote technology development while reviewing the current situation and progress.
- In June 2008, the IEA identified 17 key energy technologies that contribute to halving GHG reductions globally by 2050 and formulated technology roadmaps as the "Energy Technology Perspective 2008". Other countries and regions also formulated their own technology roadmaps.
  - Cool Earth – Innovative Energy Technology Program[4] (Japan)
  - U.S. Climate Change Technology Program, Strategic Plan (the U.S.)
  - European Strategic Energy Technology Plan (the European Commission)

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



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



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

- We should compare those existing technology roadmaps, extract some key aspects commonly shared by most roadmaps, and formulate international roadmaps. The international technology roadmaps will contribute to review the current status of technology development promoted by each country and identify the area where we should accelerate technology development and strengthen international cooperation for technology development.
- G8 countries decided to establish an international initiative with the support of the IEA, to develop roadmaps for innovative technologies and cooperate upon existing and new partnerships, including carbon capture and storage (CCS) and advanced energy technologies, at the G8 Hokkaido Toyako Summit.
- The IEA has already started to develop the international technology roadmaps by making use of the experiences of each country, and plans to complete its work in 2010.

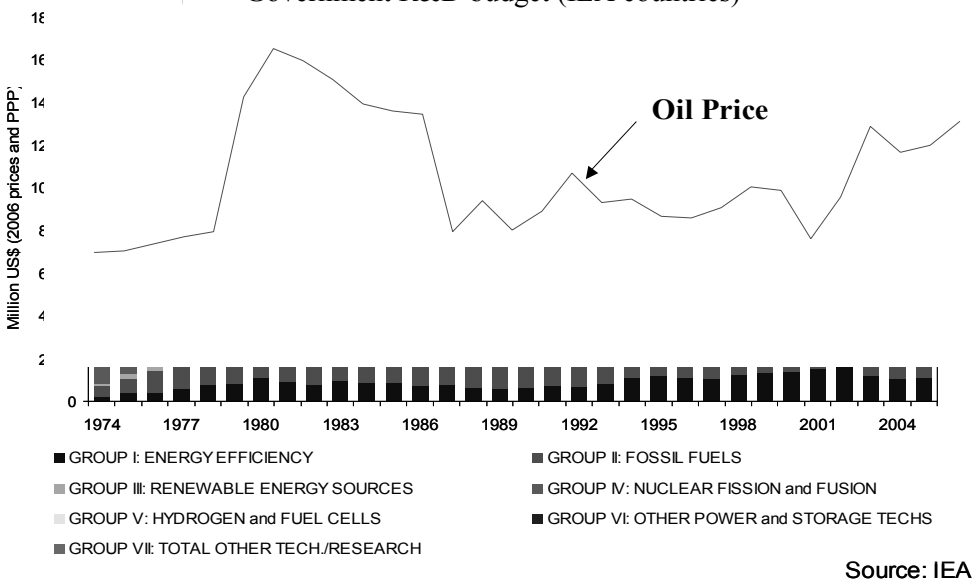
5. Financial support for development and transfer of technologies

（R&D）

(1) Government R&D investment

- As the chair of the G8 Hokkaido Toyako Summit, Japan proposes that a long-term goal of reducing GHG emissions globally at least by half by 2050 should be adopted as a shared vision under the UNFCCC. In order to achieve this long-term goal, it is absolutely essential to; quickly disseminate energy-efficient and new energy technologies currently in practical use, and steadily promote research and development of innovative technologies that have not yet been practicably available at present but are expected to contribute to substantial reduction by 2050.
- Although global investment in energy technology development increased after the two oil crises, it has been stagnating after the peak of 1980 as the crude oil price became stable. Since innovative technology development requires a large investment over a long period of time, developed countries should lead the investment in R&D for energy and environment technology and also continue to urge other countries to take those actions based on their own capabilities and circumstances.
- At the Hokkaido Toyako Summit, G8 members have "pledged over the next several years over US$ 10 billion annually in direct government-funded R&D".
- In order to realize substantial emission reductions, development of innovative technologies should be promoted through expanding government R&D investment, strengthening international cooperation including sharing roadmaps for technology development.
- The COP should ask relevant international organizations such as the IEA to annually review progress on the following points and to give advice on items such as areas where international cooperation should be strengthened:
  - Government investment amounts for R&D of technologies which contribute to emission reductions
  - Status of establishing an international roadmap for technologies development
  - Progress of international cooperation for innovative technology development

Government R&D budget (IEA countries)



Source: IEA

（Deployment）

(1) Asia-Pacific Partnership on Clean Development and Climate (APP) (described previously)

(2) Cool Earth Partnership (described previously)

PAPER NO. 9: PANAMA ON BEHALF OF COSTA RICA, MEXICO AND PANAMA

Submission by Panama on behalf of Costa Rica and Mexico

- Development and Transfer of Technologies (SBI)
  - Submissions based on the areas of focus in the terms of reference for the review and assessment of the effectiveness of the implementation of Article 4, paragraphs 1(c) and 5, of the Convention

During SBI 29 conclusions where adopted requesting submissions on the areas of focus in the terms of reference for the review and assessment of the effectiveness of the implementation of Article 4, paragraphs 1(c) and 5, of the Convention. (See FCCC/SBI/2008/L.28 and Add.1 paragraph 3 as amended in COP plenary)

(a) Review the extent to which actions have promoted and supported institutional systems and regulatory and legislative frameworks needed to scale up development and transfer of technologies;

After reviewing the current structure of the institutional systems and legislative frameworks, we found that cooperation schemes are rather scarce in the international arena, and this is particularly true for most Latin American countries. At the domestic level, these systems and frameworks for technology are frequently fragmented and poorly financed in the developing world. Furthermore, we believe that resources for R&D, towards the technologies required to address climate change challenges, have not grown at the rate required to effectively address the problem, neither in mitigation nor in adaptation, with the latter being frequently sidelined. There is also a shortcoming of efforts on education and information access.

(b) Review the range of practical actions taken and identify possible actions to promote innovative public and/or private partnerships and cooperation with the private sector, and consider steps that governments, the business sector and academia can take to facilitate effective participation by the private sector;

Equipment relying on technologies that are obsolete is frequently dumped into developing countries which mostly fail to prevent the entry of such equipment into their economies. It is also noticeable the absence of coordinated actions to facilitate, recognize and encourage the deployment and expansion of low carbon lifestyles, that do not rely in carbon-based technologies in the first place. Something similar can be said of an environment that promotes public choice towards low carbon lifestyles.

In coordination with the above, there should be international programs to help in the development, deployment and transfer of technologies adequate to regional needs. These should operate through regional centers and support and incentivize the creation of these activities within development institutions and the creation of technology research entities in key sectors. These should consider not only how to facilitate the deployment, diffusion and scaling up of climate resilient and low carbon technologies, and their role in sustainable growth, but also how can different policies, measures and actions help create an environment where intermediate and other adequate technologies help avoid emissions, and facilitate adaptation capacity.

Likewise, there is an increasing need to deploy measures at the national and international levels that

signal - both through prices and policies - that low carbon growth and climate resilient development are here to stay, and that these should increasingly be addressed by the private sector itself. Financial instruments and funds that facilitate the blending of public, private, bilateral and multilateral resources for the deployment of technologies at the scale required should be encouraged within domestic, regional and international contexts.

(c) Review the mechanisms and processes developed to enhance cooperation with relevant intergovernmental processes;

Approaches based on programs, both national and international, offer opportunities to address technology cooperation and the needs at the required scale.
Technology programs should combine both national and international actions, and should also combine domestic policies and incentives together with carbon finance and other innovative financial mechanisms. These could operate under NAMAs, and in the adaptation arena under NAPAs, and be identified through coordinated TNAs by regions.
Due to the scale of the challenge of the needed technologies deployment, all developing countries should consider and encourage the development of NAPA-like and TNA-like assessments. There should be a document prepared by the secretariat that compiles regional needs by technologies, as defined by countries within that region, and suggests areas where technologies could be aggregated to deliver economies of scale, and address the issues of scale and urgency, considering both mitigation and adaptation. This could also help to identify and assess regional needs regarding research and development, and creation of capacities. Guidelines for these should be periodically updated by the EGTT with support from the secretariat and with guidance from parties, and should consider their relation to domestic development programs and priorities, as well as to the institutional setting and national innovation system, where appropriate, in which they will operate. There is also an important need to support countries in identifying, assessing and deploying TNAs and the activities involved in them.

(d) Review efforts to promote collaborative research and development on and deployment of technologies for mitigation and adaptation;

The technology pathway for adaptation is different to that of mitigation. A general principle should consider how to enhance R&D, diffusion and scaling up of good fit adaptation technologies. The characteristics of environments enabling their use, and the circumstances in which they are used, need to be framed in the difference between adaptation and mitigation. Practical adaptation technologies are often intermediate, low capital, labour intensive and culturally relevant, and they frequently contribute to low carbon growth and development. For instance, in a highland Andean setting, artisanal greenhouses, agricultural terracing, and simple animal shelters, help to cope with extreme climate variations; while traditional rainwater harvest practices and community reservoirs can help to cope with the threat of future water scarcity due to glacier retreat. While the contribution of these technologies and practices to the GDP might be relatively small, they frequently employ a large percentage of the economically active population. The research and development, deployment, diffusion and scaling up of such technologies should receive the same attention as mitigation ones do.

There is also a need to enhance the capacity of DCs to develop and expand endogenous technologies. Regional centers to address technologies on a regional resource base could help improve capacity, practices and processes as well as the technologies themselves. Furthermore test platforms for specific technologies can help to adapt equipment, practices and technologies for their operation in DCs, and for their continuous improvement, as well as for the creation of new endogenous technologies. The cases of the geo-thermal networks in Central America and Mexico and of wind-turbine testing platforms are good examples.

(e) Review the adequacy and timeliness of the financial support provided, within the context of Article 4, paragraphs 1(c) and 5, for the purposes of development and transfer of technologies, the related activities and their results.

There is a need to explore partnerships under programs to deploy technologies by sectors, in both adaptation and mitigation, in the urgent time frame required and at the scale required. These partnerships under programs should combine national and international programs that help countries to deploy technologies in the timeframe required under TNAs, NAPAS, and NAMAS, as appropriate to the national circumstances and within the context of Article 4, paragraphs 1(c) and 5, while facilitating conditions to effectively mobilize adequate financial support.

We ask the Secretariat to produce a document along the lines above for its revision by the EGTT and SBI. This document should help outline the role of national and international programs to address adaptation and mitigation technology needs by regions. These would combine domestic actions and incentives with carbon finance, international support and innovative financial instruments, and support technology combinations in adaptation and mitigation by sectors and within global regions. The document should also suggest opportunities and identify the institutional mechanisms adequate to compile actions and technologies required by regions; identify schemes that promote the development of endogenous technologies, instruments that facilitate the adaptation of existing technologies to better address needs by global regions, the role technology pathways in adaptation and technology; and suggest options for these to work with innovative financial instruments and funds, inter alia. The document would consider its interaction with the Poznan Strategic Program in technology. Finally, it should be reviewed by the EGTT and SBI, and become a contribution to the ongoing work under the AWG-LCA.

PAPER NO. 10: SAUDI ARABIA

Saudi Arabia Submission on the Development and Transfer of Technologies

Reference to ODES/COP14/09, Parties were invited to submit their views and assessment of the effectiveness of the implementation of Article 4, paragraphs 1(c) and 5, of the Convention, referenced in FCCC/SBI/2008/L.28 and Add.1 paragraph 3 as amended in COP plenary.

Saudi Arabia sees Article 4, paragraphs 1(c) and 5, to have addressed all aspects of development and transfer of technology in developing countries, including capacity building, application and diffusion. In particular, paragraph 5 of the article has specifically addressed three levels of obligations in that respect:

- Developed countries has an obligation to promote, facilitate and finance, as appropriate, the transfer of environmentally sound technologies and know-how to developing country Parties, to enable them to implement the provisions of the Convention.

- Developed country Parties shall support the development and enhancement of endogenous capacities and technologies of developing country Parties

- International organizations such as the WTO and WIPO are called upon to facilitate the transfer of technologies to developing countries "Other Parties and organizations in a position to do so may also assist in facilitating the transfer of such technologies".

Unfortunately, due to lack of implementations, these provisions continue to remain largely invisible. In response, Saudi Arabia sees a necessary step towards the effective implementation of these provisions is the establishment of a transparent mechanism for monitoring, reporting, and verifying the compliance of Annex I countries with their specific obligations under that article.

Cp.13 Annex I stresses the need to facilitate the process for technology transfer and capacity building for all parties. Saudi Arabia emphasizes the need to facilitate these processes as indicated in sections A, B and C of the Addendum.

Saudi Arabia furthermore, supports the recommendation in section C-12.b which stresses the need to avoid trade and intellectual property rights policies, or lack thereof, restricting transfer of technology.

Trade barriers that would impede and/or hinder the transfer of needed technologies for adaptation and mitigation to developing countries should be eliminated.

Article 66.2 of TRIP agreement state that "Developing countries in particular, see technology transfer as part of the bargain in which they have agreed to protect intellectual property rights. The TRIP agreement includes a number of provisions on this, for example it requires developed countries' governments to provide incentives for their companies to transfer technology to least developed countries."

The cost of IP licensing should be an issue to study and need to be examined to the benefit of the developing countries to acquire the necessary technology at an affordable cost. It is also of a paramount importance that developing countries be granted financial and legal facilitation to enhance capacity building in areas of technology. Existing barriers that increase the cost for these technologies and know how of developing new technologies would transform the process of technology transfer and capacity building into an unrealizable objective. Hence, Saudi Arabia recommends the elimination of those barriers and the increase of incentives to technology transfer.

Furthermore, Saudi Arabia would like to recommend the set up of a separate body to address the issues of capacity building through education and training in the areas of the development of technologies with appropriate funds to be allocated to that purpose and therefore support an expanded activity as stated in item 22-f of the report "Synthesis of views on elements for the terms of reference for the review and assessment of the effectiveness of the implementation of Article 4, paragraphs 1 (c) and 5, of the Convention"

PAPER NO. 11: UZBEKISTAN

Opinion of Republic of Uzbekistan on the review and assessment of the efficiency of implementation of paragraphs 1 (c) and 5 of Article 4 of Convention

Republic of Uzbekistan supports the activities of secretariat on the execution of activities related to the development and transfer of technologies in accordance with Article 4 of Convention.

Republic of Uzbekistan as the country with the economy in transition conducts the active governmental policy on the implementation and promotion of the resource-saving and ecologically sound technologies via the provision of legislative frameworks in the context of national programs on power saving, support of development of private sector and encouragement of research studies and developments in this area.

However, the main obstacle in the practical development and technology transfer on mitigation and adaptation to climate change is still high cost of technologies and lack of finances at the national level.

In this regard we think that the review of areas which require the prior attention which are indicated in Part IV of Annex FCCC/SBI/2008/L.28, cover all main measures directed at the development and transfer of technologies.

Special attention should be paid to the Point **e)** on consideration of adequacy and timeliness of the rendered financial support in accordance with Article 4 of Convention for the development and transfer of technologies, related activities and results achieved.

Here it is necessary to speed up the operational work of the strategic GEF program on the strengthening of level of investments to transfer of technologies for rendering the support to the developing countries for satisfaction of their needs in the ecologically sound technologies.

For facilitating the access to financial support and additional resources for the Parties which are the developing countries and the countries with the economy in transition it is also important to speed up the preparation of the format of projects in the framework of this strategic program.

It is necessary to consider, in addition, the technical support to the developing countries in preparation and updating of their assessments of technological requirements on the base of the use of the revised UNDP Manual on the assessment of technological requirements in regard to climate change which should be presented at the beginning of 2009 in cooperation of the Panel of Experts on technologies transfer UNFC IPCC.

The review of updated assessment of the technological requirements provides for consideration of the degree to which the measures undertaken at the national level enable the extending of the range of activities on the development and transfer of technologies which is indicated in Point **a)** of Section IV FCCC/SBI/2008/L.28.

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