



Technology Development and Transfer for Climate Change:

A Survey of Activities by United Nations System Organizations



UNITED NATIONS
DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS



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INDUSTRIAL DEVELOPMENT ORGANIZATION

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Abbreviations and Acronyms

APFED	Asia-Pacific Forum for Environment and Development	ILO	International Labour Organization
AP-Net	Asia-Pacific Network on Climate Change	IMO	International Maritime Organization
BIOCAB	Bioenergy Capacity Building Programme	IMF	International Monetary Fund
BIOTIP	Biomass Conversion Technology On-line Platform	IPCC	Intergovernmental Panel on Climate Change
BOT	Build-Operate-Transfer	ISDR	International Strategy for Disaster Reduction
CBD	Convention on Biological Diversity	ITPO	Investment and Technology Promotion Office
CDM	Clean Development Mechanism	ITU	International Telecommunication Union
CD ₄ CDM	Capacity Development for CDM	JI	Joint Implementation
CEB	Chief Executives Board	LDCF	Least Developed Country Fund
CFC	Chlorofluorocarbon	MDG	Millennium Development Goal
CIF	Climate Investment Funds	MEA	Multilateral Environmental Agreement
CLIMPAG	Climate Impact on Agriculture	MEDITEP	Mediterranean Partnership for Sustainable Energy Development
COP	Conference of the Parties	MEDREP	Mediterranean Renewable Energy Programme
ECA	Economic Commission for Africa	NAPA	National Adaptation Programme of Actions
ECE	Economic Commission for Europe	NGO	Non-governmental Organization
ECLAC	Economic Commission for Latin America and the Caribbean	OAS	Organisation of American States
EGTT	Expert Group on Technology Transfer	OCHR	Office of the Commissioner for Human Rights
ESCAP	Economic and Social Commission for Asia and the Pacific	PIESD	Pacific Islands Energy for Sustainable Development Partnership
ESCWA	Economic and Social Commission for West Asia	ppm	Parts per Million
ESMAP	Energy Sector Management Assistance Program	REDD	Reducing Emissions from Deforestation and Forest Degradation
EST	Environmentally Sound Technology	REED	Rural Energy Enterprise Development
ETS	Emissions Trading Scheme	REEEP	Renewable Energy and Energy Efficiency Partnership
FAO	Food and Agricultural Organization	REN ₂₁	Renewable Energy Policy Network for the 21 st Century
GBEP	Global Bioenergy Partnership	R&D	Research and Development
GCOS	Global Climate Observing System	SBI	Subsidiary Body for Implementation
GEF	Global Environment Facility	SCCF	Special Climate Change Fund
GHG	Greenhouse Gas	SCF	Strategic Climate Fund
GNESD	Global Network on Energy for Sustainable Development	SEF	Sustainable Energy Finance
GVEP	Global Village Energy Partnership	SEFI	Sustainable Energy Finance Initiative
IAEA	International Atomic Energy Agency	SPA	Strategic Priority in Adaptation
ICAO	International Civil Aviation Organization	TECA	Technology for Agriculture Database
ICT	Information and Communications Technology	TNA	Technology Needs Assessment
IEA	International Energy Agency	TDT	Technology Development and Transfer
IFAD	International Fund for Agricultural Development	TT	Technology Transfer
IFC	International Finance Corporation		

TT:CLEAR	On-line Technology Information System of the UNFCCC	UN-HABITAT	United Nations Human Settlements Programme
UNCCD	United Nations Convention to Combat Desertification	UNHCR	United Nations High Commissioner for Refugees
UNCSD	United Nations Commission on Sustainable Development	UNIDO	United Nations Industrial Development Organization
UNCSTD	United Nations Commission for Science and Technology	UNITAR	United Nations Institute for Training and Research
UNCTAD	United Nations Conference on Trade and Development	UNOCHA	United Nations Office for Coordination of Humanitarian Affairs
UN-DESA	United Nations Department of Economic and Social Affairs	UNPF	United Nations Population Fund
UNDP	United Nations Development Programme	UN-REDD	United Nations Collaborative Programme on REDD
UNEP	United Nations Environment Programme	UNU	United Nations University
UNESCO	United Nations Educational, Scientific and Cultural Organization	WFP	World Food Programme
UNFCCC	United Nations Framework Convention on Climate Change	WHO	World Health Organization
UNFIP	United Nations Fund for International Partnerships	WIPO	World Intellectual Property Organization
		WMO	World Meteorological Organization
		WTO	World Tourism Organization

Executive Summary

Recognizing the crucial role that technology development and transfer must play in both addressing the challenges, and taking advantage of the opportunities posed by climate change, Parties to the United Nations Framework Convention on Climate Change (UNFCCC) agreed to promote, facilitate and finance the transfer of environmentally sound technologies (ESTs) and know-how to developing nations, and to assist those developing countries vulnerable to climate change in meeting the costs of adaptation.

In response, during 2008, the Chief Executives Board (CEB) of the United Nations organized the work of the United Nations system on climate change along five focus areas, one of which was technology transfer. The United Nations Industrial Development Organization (UNIDO) and the Department of Economic and Social Affairs of the United Nations Secretariat (UN-DESA) were assigned to act as co-conveners.

This survey provides an updated non-comprehensive overview of the range of related United Nations activities and considers some opportunities for enhancing the United Nations' role in this critical area. The survey highlights the major efforts of United Nations system organizations, the types of activity and the extent of their coverage.

The work of many of these organizations includes a focus on the complex issue of technology development and transfer. This survey identified a wealth of ongoing initiatives, highlights of which are contained in Table 1, structured according to key themes, and elaborated in part II after the introduction of this report. These initiatives are complemented by numerous activities, which build on partnerships between United Nations organizations and collaborations with other international organizations, governments and non-governmental entities. These joint efforts are highlighted in part III of this survey. When compiling the initiatives presented in this survey, a number of areas emerged, which could offer effective opportunities for enhancing the United Nations system's engagement. These areas, which are further described in part IV of this survey, are briefly summarised as follows:

- providing more comprehensive information on technologies, commercial products, techniques and methods;
- creating a global programme of accelerated public and private investment to rapidly increase capacity of renewable energy systems in conjunction with effective policy mechanisms as a means to sharply reduce costs and motivate technology improvements;
- promoting national and regional markets for ESTs and adaptive technologies, especially with an environment that will foster local production;
- enhancing the emphasis on the promotion of the development of comprehensive national plans that integrate issues of climate change with those of the environment, sustainable development and achieving the Millennium Development Goals;
- increasing the number of programmes that provide fully integrated technical assistance to help develop, manage and operate EST projects and/or businesses;
- augmenting the number of projects that involve enterprises, such as through joint ventures, for transferring, deploying and developing ESTs;
- increasing efforts that result in capacity-building through joint research involving researchers from developing nations in institutions of developed and developing countries.

Table 1: Highlights of Technology Development and Transfer Activities by United Nations Systems Organizations in the Context of Climate Change

	Organisation	Technology Needs and Needs Assessment	Technology Information
Departments and Offices	UN-DESA		<ul style="list-style-type: none"> • Development of indicators for sustainable development including those relevant to TT • Assessment of progress in the implementation of relevant targets within the framework of the MDGs
UNFCCC Entities and Associated Bodies	Secretariat	<ul style="list-style-type: none"> • Services to assist in preparation of TNAs • Updating of TNA handbook • Assessment of lessons learned and promotion of best practices • Synthesis of technology trends 	<ul style="list-style-type: none"> • Maintaining, updating & developing TT:CLEAR • Promotion of use of TT:CLEAR • Technical information sharing using TT:CLEAR & network of centres
	EGTT	<ul style="list-style-type: none"> • Services to assist in preparation of TNAs • Updating of TNA handbook • Coordination with other UNFCCC expert groups • Identification of ways to facilitate & advance TDT activities • Assistance in implementing results of the TNAs • Set of performance indicators to monitor & evaluate effectiveness of implementation of TT framework 	<ul style="list-style-type: none"> • Promotion of use of TT:CLEAR • Promotion of capacity-building training for national technology information databases
	GEF	<ul style="list-style-type: none"> • Services to assist in preparation of TNAs 	
Programmes and Funds	UNDP	<ul style="list-style-type: none"> • Services to assist in preparation of TNAs • Updating of TNA handbook 	

Enabling Environments for Technology Transfer	Capacity-building for Technology Transfer	Mechanisms for Technology Transfer (incl. technical support)
<ul style="list-style-type: none"> • Support for integrating climate change in national sustainable development plans • High-level global meetings on TDT in context of climate change • Documentation on technology transfer issues for climate change • Support for UNCSD & UN Forest Forum • Comprehensive publication on climate change issues & options • Platform for Partnerships for Sustainable Development 		<ul style="list-style-type: none"> • Participation in partnerships with TT component
<ul style="list-style-type: none"> • Providing information on publicly funded R&D activities on TT:CLEAR 	<ul style="list-style-type: none"> • Promotion of support for TT capacity-building to respond to TNA needs • Dissemination of UNFCCC guide to project proposal preparation 	<ul style="list-style-type: none"> • Technical support & training for project proposals development • Exploration of ways to enhance cooperation between UNFCCC & other MEAs • Sharing endogenous technology R&D experiences through TT:CLEAR
<ul style="list-style-type: none"> • Studies on developing enabling environments • Promotion of trade & intellectual property rights policies that do not restrict TT • Promotion of information sharing on collaboration in publicly funded R&D • Promotion of integration of TT into national policies 	<ul style="list-style-type: none"> • Promotion of support for TT capacity-building to respond to TNA needs • Learning centres & partnership fairs for increased TDT communication & outreach • Promotion of training in management & operation of climate technology • Promotion of TT capacity-building institutions in developing countries • Promotion of capacity-building seminars & workshops on adaptation 	<ul style="list-style-type: none"> • Technical support & training for project proposals development • Promotion of success stories in financing of TDT projects in emerging markets • Promotion of environment attractive to private sector investment through access to multilateral sources • Promotion of innovative public-private financing mechanisms • Exploration of ways to enhance cooperation between UNFCCC & other MEAs • Promotion of information sharing on barriers to endogenous technology R&D • Options for promoting institutions for endogenous technology R&D • Options for promoting regional research platforms using existing networks • Document recommending future financing options for TDT • Assessment of strategies & innovative funding opportunities or incentives for engaging relevant stakeholders and partners • Assessment of gaps & barriers to use of and access to existing & new financing resources & relevant vehicles
<ul style="list-style-type: none"> • Financial support for creating markets for ESTs 	<ul style="list-style-type: none"> • Financial support for capacity-building for TT in most EST projects 	<ul style="list-style-type: none"> • Promotion of demonstration, deployment, diffusion & transfer of ESTs at various stages of the technology development cycle through the GEF Trust Fund, SCCF & LDCF • Promotion of innovative public-private financing mechanisms (Earth Fund) • Management LDCF & SCCF to fund adaptation • Poznan Strategic Programme on TT to scale up investment • Participation in partnerships with TT component • Provision of financial support to developing countries for implementation of TT framework
<ul style="list-style-type: none"> • Support for NAPA preparation 	<ul style="list-style-type: none"> • Support for capacity building for TT in some EST projects • Support for CDM capacity development • Training for participation in LDCF & SCCF 	<ul style="list-style-type: none"> • Technical support & training for project proposals development • Support for TT of ESTs in projects • UNDP Adaptation Portfolio • Adaptation Learning Mechanism • Country Adaptation Profiles Database • Support for UN-REDD Programme • Support for GVEP, GNEED & other networks/partnerships • Participation in partnerships with TT component

Table 1: Highlights of Technology Development and Transfer Activities by United Nations Systems Organizations in the Context of Climate Change

	Organisation	Technology Needs and Needs Assessment	Technology Information
Programmes and Funds	UNEP	<ul style="list-style-type: none"> Assessments of Impacts & Adaptations to Climate Change Initiative Services to assist in preparation of TNAs 	
	UNCTAD		<ul style="list-style-type: none"> Expert meetings on renewable energy technologies
Regional Commissions	ESCAP	<ul style="list-style-type: none"> Services for TNA preparation 	
	ECE	<ul style="list-style-type: none"> Services for TNAs in relation to energy efficiency investments 	
	ECA		
Specialized Agencies	WB	<ul style="list-style-type: none"> Services to assist in preparation of TNAs 	
	UNIDO		<ul style="list-style-type: none"> Specialized tools and on-line platforms for promoting TT
	FAO		<ul style="list-style-type: none"> Tools, databases & guides for assessing climate change impacts on agriculture CLIMPAG integrated platform Technology for agriculture database

Enabling Environments for Technology Transfer	Capacity-building for Technology Transfer	Mechanisms for Technology Transfer (incl. technical support)
<ul style="list-style-type: none"> Support for NAPA preparation 	<ul style="list-style-type: none"> Support for capacity building for TT in some EST projects Support for CDM capacity development Training for participation in LDCF & SCCF 	<ul style="list-style-type: none"> Technical support & training for project proposals development Support for technical programmes on ESTs EST development & deployment through partnerships & joint programmes UNIDO-UNEP Network of National Cleaner Production Centres/Programmes REED Initiative Seed Capital Assistance Facility SEFI & SEF Alliance Energy & Carbon Finance Programme Support for GNEED, REN21 & other networks/partnerships Support for UN-REDD Programme Global Climate Change Adaptation Network Sustainable Energy Finance Directory Participation in partnerships with TT component
<ul style="list-style-type: none"> Expert meetings to explore trade & climate change issues 	<ul style="list-style-type: none"> Guidebook on the CDM Training under UNCTAD Biofuels Initiative 	
	<ul style="list-style-type: none"> CDM guidebook for local governments 	<ul style="list-style-type: none"> Technical cooperation & advisory services Technical support & training for project proposals development Assistance in development of CDM projects Green Growth Programme Participation in partnerships with TT component
<ul style="list-style-type: none"> Market formation & TT through capacity-building & policy reforms for energy efficiency & renewable energy investments 	<ul style="list-style-type: none"> Meetings, seminars & training in energy efficiency 	<ul style="list-style-type: none"> Technical cooperation & advisory services Regional Advisory Programme on Energy Financing Energy Efficiency Investments for Climate Change Mitigation Global Energy Efficiency 21 Project Working Group on Climate Change Adaptation and Mitigation for the ECE Region in cooperation with UNEP
	<ul style="list-style-type: none"> Global Climate Change & Africa Science Activities 	<ul style="list-style-type: none"> Technical cooperation & advisory services
	<ul style="list-style-type: none"> Support for capacity building for TT in some EST projects Support for CDM capacity development Training for participation in LDCF & SCCF 	<ul style="list-style-type: none"> Support for TT of ESTs in projects Establishment of carbon funds & facilities that can support TT projects Carbon Finance Assist Program to ensure developing country participation Carbon Partnership Facility Climate Investment Funds Climate Technology Program to pilot “climate technology centre” concept Document on lessons from non-energy sectors to accelerate R&D for ESTs
<ul style="list-style-type: none"> Technology Foresight Programme Support for development of International Energy Management Standard 	<ul style="list-style-type: none"> Support for capacity building for TT in some EST projects Support for CDM capacity development Support for Business Information Centres Network of Subcontracting & Partnership Exchanges Support for capacity building through its technical programmes, CDM & II Capacity-building tools developed from programmes Support for on-line platform PLATECH for development of science & technology parks Publications and manual with focus on TT 	<ul style="list-style-type: none"> Technical support & training for project proposals development Support for technical programmes on ESTs UNIDO-UNEP Network of National Cleaner Production Centres/Programmes Centres for South-South Cooperation International Technology Centres Network of Investment and Technology Promotion Offices African Investment Promotion Agency Network Participation in partnerships with TT component
	<ul style="list-style-type: none"> Training for assessing climate change impacts on agriculture 	<ul style="list-style-type: none"> Support for technical programmes on ESTs related to agriculture Support for TT for new crop strains adapted to new climate conditions Support for UN-REDD Programme

The United Nations system is currently engaged in a substantial effort, across a broad spectrum of complementary activities, to assist the international community in mitigating and adapting to climate change and especially to better prepare developing nations to adapt to the adverse effects. While the magnitude of this effort is exceptional and many activities are innovative, it will be crucial to make an even more effective use of the wealth of the expertise and experience available within the United Nations system in pursuit of an endeavour that can be achieved only through global cooperation.

I. Introduction

1. In the global effort to mitigate and adapt to climate change, technology development and transfer must play a key role in ensuring that all countries continue to move forward on the path toward sustainable development while having the requisite capacities to contribute to meeting one of humanity's most crucial challenges. In support of technology development and transfer in the context of climate change, the United Nations, through its many constituent organizations¹, is undertaking a broad range of activities of considerable magnitude. This survey presents an overview of the varied approaches, areas covered and the types of activity undertaken in tackling this challenge.

2. The importance of technology development and transfer in preserving the environment was recognized at the United Nations Conference on Environment and Development in Rio de Janeiro, Brazil, in 1992². However, since the international community began a more focused effort to tackle the challenge posed by climate change, the issue of technology development and transfer has become even more urgent. Thus, under the United Nations Framework Convention on Climate Change (UNFCCC), governments are committed to promoting and cooperating in the development, application, transfer and diffusion of technologies, practices and processes that control, reduce and prevent anthropogenic emissions of greenhouse gases (GHGs). They also agreed to cooperate in preparing for adaptation to the impacts of climate change³. At the UNFCCC meeting in December 2007, governments adopted the Bali Action Plan⁴ which, among other issues, addressed enhanced action on technology development and transfer to support mitigation of and adaptation to climate change⁵. At the UNFCCC conference in December 2009, the Conference of the Parties (COP) took note of the non-binding Copenhagen Accord⁶, which decided to accelerate technology development and transfer by establishing a Technology Mechanism that will be country-driven and based on national circumstances and priorities.

3. During 2008 and in support of the Bali Action Plan, the Chief Executives Board (CEB) of the United Nations organized the work of the United Nations system on climate change along five focus areas, one of which is technology transfer. It also selected two organizations to act as co-conveners of this focus area: the United Nations Industrial Development Organization (UNIDO) and the Department of Economic and Social Affairs of the United Nations Secretariat (UN-DESA). Thus, the aims of the Technology Transfer Working Group are to enhance coherence and facilitate cooperation among

¹ In this survey, "organization" in the context of the United Nations system is used as a cover term to refer to any of the constellation of relevant Secretariat departments, offices, regional commissions, programmes, specialized agencies, international financial institutions, specialized funds, financing facilities, universities, institutes, conference and convention secretariats, strategies, intergovernmental commissions and panels, executive boards and committees, and interagency mechanisms that are components of the United Nations system or closely affiliated with it.

² *Agenda 21: The United Nations programme of action from Rio*, United Nations (1992).

³ United Nations Framework Convention on Climate Change (1992).

⁴ In this survey, the term "Bali Action Plan" includes, in addition to the Plan itself, the set of supporting decisions taken at the thirteenth session of the Conference of the Parties (COP) to the UNFCCC, held in Bali, Indonesia, 3-14 December 2007.

⁵ FCCC/CP/2007/6/Add.1 (14 March 2008).

⁶ <http://unfccc.int/meetings/cop15/items/5257.php>.

United Nations system organizations on the development, transfer and diffusion of technologies for mitigation and adaptation. As one of its first steps, the co-conveners are undertaking a survey of the main activities of United Nations system organizations that contribute to the development and transfer of technologies.

4. This survey presents the preliminary results of that effort. Its purpose is to provide an updated overview of the range of United Nations activities that promote technology development and transfer in the context of climate change. This survey is not an attempt to provide a comprehensive review of all activities undertaken in addressing this issue, but rather to give highlights of the major efforts of United Nations system organizations, types of activity and the extent of their substantive coverage. Based on a desk review undertaken over a short period of time, this survey relies on the information obtainable through the internet, primarily from the websites of United Nations organizations accessible through the “Gateway to the United Nation’s Work on Climate Change”⁷, supplemented by information provided by focal points in the organizations. Current information of this type is especially important in attempting to assess the scale of support for the various activities. It is possible that the information on these websites may not fully represent all the relevant current activities of every organization concerned and, thus, that the survey may inadvertently contain a few gaps. Therefore, any omissions or inadequate representations that may appear in this survey are sincerely regretted. Moreover, once fuller information becomes available, this survey may need to be revisited.

⁷ <http://www.un.org/wcm/content/site/climatechange/gateway>.

II. Efforts by United Nations system organizations

5. The work of many United Nations organizations includes a focus on the complex issue of technology development and transfer. Often, related activities are an integral sub-component of programmes addressing climate change issues and can in many cases not be explicitly separated from the overall programmes. This section highlights the major contributions by United Nations organizations, covering both initiatives, which directly target technology development and transfer, and programmes, which include it as an essential part of their activities. Highlights of these technology development and transfer activities are contained at the end of the executive summary in Table 1, structured according to key themes.

The UNFCCC Secretariat⁸

6. Climate change forms the basis of the mandate of the UNFCCC Secretariat, which has the complex job of servicing the dynamic set of bodies and processes established under the Convention. The Secretariat coordinates and facilitates the implementation of activities of the Expert Group on Technology Transfer (EGTT).

7. The UNFCCC Secretariat is mandated by the Conference of the Parties to facilitate the implementation of a wide range of activities forming part of the Technology Transfer Framework⁹. The Framework includes the following areas:

- Technology needs and needs assessment;
- Technology information;
- Enabling environments for technology transfer;
- Capacity-building for technology transfer; and
- Mechanisms for technology transfer including innovative options for financing, enhancing cooperation with relevant conventions and intergovernmental processes, endogenous technology development, and collaborative research and development.

The Secretariat is also responsible for facilitating a regular review by the Conference of the Parties (COP) on the effectiveness of the implementation of the technology transfer provisions of the Convention, taking into account activities inside and outside of the Convention. Currently, the Secretariat is about to complete a review of paragraph 4.5 and subparagraph 4.1c of the Convention that deal with the development, diffusion and transfer of technology. The findings and conclusions of this review are expected to reveal areas for improvement in the Technology Transfer Framework.

⁸ The primary website and links to relevant web pages and documents can be found at: <http://unfccc.int/2860.php>.

⁹ The Technology Transfer Framework was established by COP decision 4.CP.7 and was enhanced by subsequent decisions 3/CP.13 and 4/CP.13.

8. To support the implementation of the Technology Transfer Framework, the UNFCCC Secretariat has developed valuable tools that relate directly to technology development and transfer. With the objective of improving the flow of, access to and quality of information relating to the development and transfer of environmentally sound technologies (ESTs), the Secretariat is developing a technology information system (TT:CLEAR¹⁰) that includes an inventory of environmentally friendly technologies and technology development and transfer projects, as well as information on related financing¹¹. TT:CLEAR also provides access to information on technology needs identified in national TNA reports, National Adaptation Programmes of Actions (NAPAs) and National Communications¹² to the UNFCCC. All of these provide valuable information and concepts that can be further developed into projects and activities to support mitigation and adaptation actions by developing countries, as well as valuable insights for the development of TNAs by countries that have yet to complete their reports.

9. The Secretariat is operating a pilot project on networking between TT:CLEAR and national and regional technology information centres to provide a clear understanding of the technical feasibility and cost implications of strengthening technology information centres in developing countries.

10. Another important set of tools are provided in the form of publications, examples of which include:

- The “UNFCCC Guidebook on Preparing Technology Transfer Projects for Financing”, addressing the preparation of project proposals by project developers in developing countries in order to enable them to meet the standards of international financial providers¹³;
- “Innovative Options for Financing the Development and Transfer of Technologies”¹⁴; and the
- “Handbook on Conducting Technology Needs Assessment for Climate Change”¹⁵.

11. The Secretariat supports negotiations conducted by the Ad Hoc Working Group on Long-term Cooperative Action under the Convention (AWG-LCA), which includes negotiations on the four main building blocks of the Bali Action Plan: mitigation, adaptation, finance and technology. While negotiations will continue in 2010, the establishment of a new Technology Mechanism under the Convention is gaining increasing support from Parties. This new mechanism might replace the EGTT and would be supposed to significantly enhance cooperative action on technology development and transfer.

¹⁰ The UNFCCC Technology Information Clearing House.

¹¹ <http://unfccc.int/ttclear/jsp/index.jsp>.

¹² National Communications are national reports on implementation of the Convention that Parties to the Convention must submit to the COP through the UNFCCC Secretariat. The core elements of all National Communications are information on emissions and removals of GHGs and details of the activities a Party has undertaken to implement the Convention. National Communications usually include information on transfer of technology.

¹³ Accessible at: <http://unfccc.int/ttclear/jsp/guidebook.jsp>.

¹⁴ Accessible at: http://unfccc.int/resource/docs/publications/innovation_eng.pdf.

¹⁵ Accessible at: http://unfccc.int/ttclear/pdf/TNAHandbook_9-15-2009.pdf.

The Expert Group on Technology Transfer (EGTT)¹⁶

12. The EGTT was established in 2001 by the Conference of the Parties (COP) to the UNFCCC as a body of experts serving in their individual capacities. The EGTT, with the assistance of the UNFCCC Secretariat, is mandated to, inter alia,

- analyse, identify and recommend ways to facilitate and advance technology development and transfer activities;
- help implement results of the TNAs;
- develop a set of performance indicators that could be used to regularly monitor and evaluate the effectiveness of the implementation of the technology development and transfer framework;
- assess strategies and innovative funding opportunities or incentives for engaging the participation of relevant stakeholders and partner organizations;
- identify and analyse existing and potential new financing sources and relevant vehicles in supporting the development, deployment, diffusion and transfer of ESTs in developing countries;
- assess gaps and barriers for these financing resources; and
- broadly communicate the results of this work. Having been considering this matter in depth since 2002, the EGTT has developed a unique expertise that renders its recommendations particularly important.

13. Thus, in addition to undertaking studies and preparing reports on findings, the EGTT, with the support of the UNFCCC Secretariat also collaborates with other United Nations system organizations:

- in providing technical assistance to non-Annex I Parties to conduct TNAs;
- in organizing regional workshops on conducting TNAs;
- in convening expert workshops on technology information, enabling environments for technology transfer, the development and transfer of ESTs for adaptation, and on innovative options for financing the development and transfer of technologies and specifically the results of the TNAs;
- in designing and implementing an outreach programme for TT:CLEAR; and
- in organizing side events on issues related to technology development and transfer.

It also collaborates with business and industry and public-private partnerships in organizing sector-specific workshops.

14. Recent documents issued by the EGTT include “Recommendations on future financing options for enhancing the development, deployment, diffusion and transfer of technologies under the Convention”¹⁷ and a “Strategy paper for the long-term perspective beyond 2012, including sectoral approaches, to facilitate the development, deployment, diffusion and transfer of technologies under the Convention”¹⁸. The EGTT has recently issued a report on “Performance indicators to monitor and

¹⁶ The primary website and links to relevant web pages and documents can be found at: http://unfccc.int/cooperation_and_support/technology/items/1126.php.

¹⁷ FCCC/SB/2009/2 (26 May 2009).

¹⁸ FCCC/SB/2009/3 (27 May 2009).

evaluate the effectiveness of the implementation of the technology transfer framework¹⁹. For each of these documents a summary has also been issued.

15. The EGTT has also:

- held consultations with relevant international organizations and solicited information on their abilities to support certain activities;
- worked with the UNFCCC Secretariat and the United Nations Development Programme (UNDP) to update the UNDP handbook, “Conducting Technology Needs Assessment for Climate Change”²⁰;
- organized capacity-building and outreach activities to promote the use of this handbook;
- made available the results of the TNAs, and related experience and lessons learned in the TNA process through the UNFCCC Secretariat and relevant international organizations;
- undertaken technical studies on barriers, good practice and recommendations for producing enhanced enabling environments to accelerate the development and transfer of ESTs;
- implemented regional training programmes on project preparation through the UNFCCC Secretariat and in collaboration with UNIDO, the United Nations Institute for Training and Research (UNITAR), the United Nations Environment Programme (UNEP), UNDP and other international organizations;
- explored possible ways to enhance cooperation between the UNFCCC, and other multilateral environmental agreements (MEAs) and intergovernmental processes; and
- considered options for encouraging the establishment of mechanisms such as national systems of innovation that could lead to the endogenous development of technologies, as well as regional research platforms, e.g., through the use of existing networks of centres of excellence.

16. The EGTT has also been requested to maintain an ongoing dialogue with the private sector on technical and policy issues pertinent to enhancing technology development and transfer. In collaboration with the private sector, it is also exploring options to enhance the role of the business community within the UNFCCC process.

The Global Environment Facility (GEF)²¹

17. As the financial mechanism of the UNFCCC, the GEF plays a key role in the work of the international community by providing financial resources to support work on a number of environmental priorities including climate change. The GEF Trust Fund focuses primarily on mitigation

¹⁹ FCCC/SB/2009/4 (11 November 2009).

²⁰ Accessible at: http://unfccc.int/ttclear/pdf/TNAHandbook_9-15-2009.pdf.

²¹ The primary website and links to relevant web pages and documents can be found at: <http://www.thegef.org/gef/> although it should be noted that a re-launching of the GEF website is expected soon which could affect all GEF web addresses cited in this document. Also, much information is drawn from “Transfer of Environmentally Sound Technologies: The GEF experience”, Global Environment Facility, Washington, DC (2008).

activities and the reduction of GHG emissions by supporting renewable energy and energy efficiency projects. Since its inception in 1991, the GEF has allocated US\$ 2.7 billion and, currently, supports projects involving more than 40 climate-friendly technologies in almost 100 developing countries. This funding has leveraged an estimated additional US\$ 17.2 billion in co-financing from the GEF's partner agencies, national and local governments, non-governmental organizations (NGOs) and the private sector. Currently, the GEF allocates and disburses US\$ 250 million annually for climate change mitigation. In addition, the GEF has provided funding for TNAs and other enabling and capacity-building activities in over 100 developing countries. While many of the projects and programmes that involve technology transfer have been completed, a major portion of the total is still on-going and many new projects are currently under consideration for funding. In fact, the GEF is working to incorporate a technology transfer focus throughout all of its climate change programmes and projects. The publication "Transfer of Environmentally Sound Technologies: The GEF Experience"²² provides a valuable introduction to the GEF's technology transfer related work.

18. GEF projects that help developing countries mitigate the effects of climate change by reducing GHG concentrations in the atmosphere focus on removing barriers to energy efficiency, promoting renewable energy, reducing costs of low-GHG emitting energy technologies, supporting sustainable transportation and helping markets operate effectively. The mitigation technologies supported by GEF activities include a range of energy-efficiency technologies, such as efficient lighting, energy-efficient appliances, energy-efficient building designs and materials, industrial energy-efficient technologies including cogeneration, district heating systems, high-efficiency boilers, and energy-efficient CFC²³-free chillers, as well as many renewable energy technologies, including solar photovoltaic technologies, solar water heaters, solar thermal process heating, wind turbine power generation, geothermal power, methane from municipal waste, mini- and micro-hydropower, wave energy technology, biomass cogeneration, waste biomass boilers, biomass gasification for electricity, concentrating solar power systems, and integrated systems involving several energy technologies. The GEF has further supported the following low-GHG emitting energy technologies for mitigation: stationary fuel-cell power generation, hydrogen-based fuel-cell buses, bus rapid transit systems, coal-bed and coal mine methane recovery, land-fill gas recovery, and coal gasification.

19. The GEF supports interventions that increase resilience to the adverse impacts of climate change on vulnerable countries, sectors and communities. Since the creation of the Strategic Priority on Adaptation (SPA) of the GEF Trust Fund, and the establishment under the UNFCCC of the Least Developed Countries Fund (LDCF) and the Special Climate Change Fund (SCCF), GEF-administered funding for adaptation has totalled about US\$ 400 million. The GEF also provides secretariat services to the Adaptation fund Board under the Kyoto Protocol. Technology transfer has been a major component in most adaptation projects funded under the LDCF, SCCF and SPA, all of which are operated by the GEF under guidance from the COP. The GEF's support to technology transfer related to adaptation includes soft components like institutional support for knowledge transfer to decision makers on mainstreaming technical aspects of adaptation concerns in sector development planning as well as technical assistance for pilot and demonstration activities, e.g., related to wetland and

²² <http://www.thegef.org/gef/publist>

²³ Chlorofluorocarbons are ozone-depleting substances, some of which are also GHGs.

mangrove restoration. It further includes innovative irrigation systems, drought-resistant crops, climate-proofing infrastructure, and the transfer of high-technology electronics for data logging and alert systems. Many adaptation pilot activities are also centred on improved management of current local or traditional knowledge and technologies, or on improved access to adaptation-relevant information that increases the efficacy of current management. The wide range of technology transfer activities related to adaptation covers ecosystems, agriculture, waste management, coastal zone management, disaster risk management and health, and, within these sectors, deals with the transfer of technology information and technologies, as well as capacity-building, coordination and policy support.

20. The GEF funds a variety of project types: Small Grants, Enabling Activities, Medium-sized Projects and Full-Sized Projects. In support of its projects and programmes, the GEF provides convenient on-line tools for preparing funding applications including:

- guidelines and templates for each project type²⁴;
- a project database for all approved GEF projects that can be searched by country, focal area (e.g., climate change), agency, project type and funding source²⁵; and
- a country profile showing details about the GEF involvement for each country²⁶.

21. As a result of the GEF's extensive experience, the COP at its thirteenth session in Bali requested the GEF to develop a strategic programme to scale up the level of investment for technology transfer to help developing countries address their needs for ESTs, to elaborate how such a programme might be implemented and to identify the programme's relationship to existing and emerging activities and initiatives regarding technology transfer. In response, the GEF submitted its report²⁷ to the Subsidiary Body for Implementation (SBI) of the UNFCCC, which was considered and adopted at its twenty-ninth session in Poznan, Poland, in December 2008, as the Poznan Strategic Programme on Technology Transfer²⁸. On this basis, the GEF has launched a US\$ 50-million strategic programme on technology transfer, drawn from the GEF Trust Fund and the SCCF, to support

- TNAs,
- piloting priority technology projects linked to TNAs, and
- the dissemination of GEF experience and successfully demonstrated ESTs.

22. In accord with the COP decision at its fourteenth session that requested the GEF to consider the long-term implementation of the strategic programme on technology transfer, the GEF has identified technology transfer as a long-term priority in the climate change focal area. Linked to the replenishment of the GEF Trust Fund, the GEF Secretariat is currently finalizing a climate change strategy for the fifth replenishment of the GEF covering the period from 2010 to 2014, in consultation with its advisory bodies, the GEF Agencies and other stakeholders. It is expected that this strategy will prominently feature support for technology transfer at various stages of the technology

²⁴ http://www.gefweb.org/interior_right.aspx?id=16674.

²⁵ <http://projectdatabase.thegef.org/>.

²⁶ <http://www.gefonline.org/Country/CountryProfile.cfm>.

²⁷ GEF/C.34/5.Rev.1.

²⁸ FCCC/SBI/2008/16 (26 November 2008).

development cycle, from demonstration of innovative, emerging low-carbon technologies to diffusion of commercially proven ESTs and environmentally sound practices, and will specifically

- promote the demonstration, deployment, and transfer of innovative low-carbon technologies,
- promote market transformation for energy efficiency in industry and the building sector,
- promote investment in renewable energy technologies,
- promote energy efficient, low-carbon transport and urban systems,
- promote conservation and enhancement of carbon stocks through sustainable management of land use, land-use change, and forestry, and
- support enabling activities and capacity building under the UNFCCC.

The first of these objectives will focus on such technologies at the stage of market demonstration or commercialization when technology push is still critical. The other objectives will focus on technologies that are commercially available but face barriers and require market pull to achieve widespread adoption and diffusion.

The World Bank²⁹

23. As the major financing institution of the United Nations system, the World Bank plays a key role in attracting the funds necessary to accelerate the transfer of the technologies needed to meet the dual challenges of mitigation and adaptation for climate change. Over the decades, environmental concerns with implications for technology transfer have increasingly become a part of the loan projects and programmes as well as other activities of the World Bank. With the growing global concern for climate change, the World Bank has become increasingly involved in major financing support for both mitigating and adapting to climate change, notably through its position as an Implementing Agency of the Instrument for the Establishment of the Restructured Global Environment Facility, as well as its role as a GEF Agency. Currently, the World Bank provides US\$ 22.5 billion for all of its activities in support of climate change, with US\$ 1.7 billion being dedicated to Africa, US\$ 8.4 billion to East Asia and the Pacific, US\$ 4.5 billion to Europe and Central Asia, US\$ 3.7 to Latin America and the Caribbean, US\$ 0.4 billion to West Asia and North Africa and US\$ 3.8 billion to South Asia. Included among these activities are new initiatives that contribute to financing technology transfer in the context of climate change, often in innovative ways.

24. Notable among these initiatives are the carbon funds and facilities that were made possible by the Kyoto Protocol as well as the European Union's Emissions Trading Scheme. The World Bank Carbon Finance Unit uses funding contributed by governments and corporations in industrialized countries to purchase project-based GHG emission reductions in developing countries and countries with economies in transition. These GHG emission reductions are purchased through one of its carbon funds or facilities on behalf of the contributor and within the framework of either the Kyoto

²⁹ The primary website and links to relevant web pages and documents can be found at: <http://beta.worldbank.org/climatechange/>.

Protocol's Clean Development Mechanism (CDM) or its Joint Implementation (JI) arrangement. These carbon funds and facilities include

- the Bio Carbon Fund designed to demonstrate projects that sequester carbon in forest and agricultural ecosystems,
- the Carbon Fund for Europe designed to help European nations meet their commitments to the Kyoto Protocol and the European Union's Emissions Trading Scheme,
- the Community Development Carbon Fund for projects in the poorer areas of the developing world,
- the Danish Carbon Fund and the Netherlands CDM Facility, which both support CDM projects in developing countries,
- the Italian Carbon Fund and the Spanish Carbon Fund, which both support CDM and JI projects in developing countries and countries with economies in transition,
- the Netherlands European Carbon Facility designed to support JI projects only, and
- the Prototype Carbon Fund, which partners seventeen corporations and six governments to pioneer a market for CDM and JI project-based GHG emission reductions while providing a learning-by-doing opportunity for its stakeholders.
- the Umbrella Carbon Facility, which provides an innovative approach to the limits often placed on the size of purchases by emission reduction buyers: it provides an opportunity to pool funds in support of large CDM and JI projects.
- the Forest Carbon Partnership Facility, which assists developing countries in their efforts to reduce emissions from deforestation and land degradation by building capacity in 37 developing countries and testing a programme of performance-based incentive payments in selected pilot countries on a relatively small scale. And,
- the newly proposed Carbon Partnership Facility, which is designed to operate over long periods after the end of the regulatory period of the Kyoto Protocol in 2012.

25. Another innovative advance is the establishment of the Climate Investment Funds (CIF) as an interim financing arrangement to bridge the financing and learning gap between now and the next international climate change agreement after 2012. Last year, the World Bank Board of Executive Directors approved the CIF, which are managed by the World Bank and implemented jointly with the regional development banks. There are two distinct funds: the Clean Technology Fund to promote increased financing for demonstration, deployment and transfer of low-carbon programmes and projects and includes programmes in the power sector, the transport sector and energy efficiency; and the Strategic Climate Fund (SCF) that provides financing to pilot new development approaches and support targeted programmes. Together, they reached US\$ 6.3 billion in January 2010. The SCF includes: (1) the Pilot Program for Climate Resilience to provide incentives for scaled-up action and transformational change in integrating consideration of climate resilience into national development planning; (2) the Forest Investment Program to mobilize significantly increased investments to reduce deforestation and forest degradation and promote improved sustainable forest management; and (3) the Program for Scaling-up Renewable Energy in Low Income Countries to demonstrate the economic, social and environmental viability of low-carbon development pathways in the energy sector through the use of renewable energy.

26. In support of countries interested in participating in its carbon financing arrangements, the World Bank has launched the Carbon Finance Assist Program with the primary objective of ensuring that developing countries and countries with economies in transition are able to fully participate in the funding mechanisms of the Kyoto Protocol and benefit from the gains associated with such projects. This programme organizes seminars, symposia and courses and offers a regular on-line bulletin³⁰.

27. The Multilateral Investment Guarantee Agency of the World Bank Group contributes to reducing the adverse impact of climate change by supporting “green” infrastructure investments in developing countries, which build renewable energy capacity, encourage resource and energy conservation and efficiency, and improve sanitation and off-set GHG emissions.

28. In addition to these newer programmes, the World Bank continues to offer its traditional assistance for projects that often relate to climate change. For the 79 poorest nations, the World Bank provides special assistance arrangements such as the International Development Association. For private companies in emerging markets, the World Bank’s International Finance Corporation (IFC) provides expert advice on reducing, managing and mitigating the impacts of climate change on their businesses and supports investments in cleaner technologies, sustainable energy and carbon finance.

29. The IFC also provides climate change tools for financial institutions such as a methodology for the measurement of portfolio GHG emissions. Another useful tool is the on-line directory of World Bank climate change projects organized by region from which details for each project can be obtained including information on technology transfer components³¹.

30. With the support and partnership of the UK Government, infoDev, a global development financing programme housed in and supported by the World Bank, has launched a Climate Technology Program. This initiative involves a partnership with UNIDO in piloting the “climate technology innovation centre” concept and investigating country-specific interventions to accelerate the development, deployment and transfer of locally relevant climate technologies in middle- and low-income countries.

31. Among the relevant publications of the World Bank, “Accelerating Clean Energy Technology Research, Development, and Deployment: Lessons from non-energy sectors”³² is particularly relevant. It provides an analysis of the experience of four successful international innovation efforts in agriculture, pharmaceuticals, biotechnology and distributed innovation, and shows the crucial contribution that technology development and transfer could make to accelerate the deployment of ESTs.

³⁰<http://web.worldbank.org/WBSITE/EXTERNAL/WBI/WBIPROGRAMS/ENRLP/EXTCARFINASS/o,,contentMDK:22340067~pagePK:64168445~piPK:64168309~theSitePK:3287761,00.html#Top>.

³¹ Accessible at <http://beta.worldbank.org/climatechange/financing/>

³² Accessible at: http://www.esmap.org/filez/pubs/78200895253_accelerating_clean_energy.pdf

The United Nations Development Programme (UNDP)³³

32. As the major development project financing and implementation programme of the United Nations, UNDP has a long experience in project development and implementation. The focus of its work has evolved over many decades so that it now has had considerable involvement in technology transfer in the context of climate change. Its multi-pronged approach to climate change focuses on climate change and poverty, adapting to climate change, mitigation, integrating climate change into development, and capacity development.

33. UNDP funds many country, regional, interregional and global projects under its environment and energy sector that deal with climate change and have technology transfer components. Since UNDP is also an Implementing Agency of the Instrument for the Restructured Global Environment Facility, an impressive number of its extensive portfolio of ongoing technology transfer related projects directly deal with the GEF. These UNDP-GEF projects cover renewable energy technologies, energy efficiency, sustainable transportation, adaptation, new low-GHG energy technologies, and support for enabling activities and National Communications. In addition to those projects financed from the GEF Trust Fund, UNDP administers or contributes to projects and activities of programmes established under the Kyoto Protocol to the UNFCCC: the CDM, JI, SCCF and LDCF.

34. UNDP is engaged in developing its portfolio of projects dealing with adaptation to climate change. Pilot initiatives from UNDP's Adaptation Portfolio under implementation or about to commence amount to US\$ 49 million in GEF funding, or \$136 million including co-financing, for 25 projects in 41 countries. Additionally, project in early stages of preparation worth US\$ 42 million await approval for funding. Moreover, UNDP is supporting 30 countries in the preparation of their NAPAs. The Adaptation Learning Mechanism is a US\$ 1 million project to capture and disseminate adaptation experiences and good practices via an open knowledge platform that is funded by the GEF and national donors and implemented by UNDP in partnership with UNEP and the World Bank. UNDP and the GEF jointly manage the GEF-funded National Communications Support Programme that assists more than 130 countries in the preparation of their submissions to the UNFCCC.

35. In addition to field projects, UNDP provides support for many training and capacity-building activities and for tools designed to assist in project development and evaluation. Among the numerous relevant publications of UNDP, the "Handbook for Conducting Technology Needs Assessment for Climate Change"³⁴, as well as a CDM manual and the series of UNDP-GEF Adaptation Policy Frameworks for Climate Change are particularly important for advancing the technology transfer process. The MDG Carbon Facility offers a comprehensive package of project development services for preparing GHG emission reduction projects and getting them to market.

36. UNDP provides detailed information on all projects on individual web-pages for each region and country. It maintains a separate project database for its Adaptation Portfolio that can be searched

³³ The primary website and links to relevant web pages and documents can be found at: <http://www.undp.org/climatechange/>.

³⁴ Accessible at: http://unfccc.int/ttclear/pdf/TNAHandbook_9-15-2009.pdf.

by region, country, funding source and thematic area³⁵. A UNDP supported resource for transferring and sharing knowledge on adaptation to climate change is the Country Adaptation Profiles Database hosted by the Adaptation Learning Mechanism, which provides information on international, regional and national initiatives in over 140 countries as well as convenient access to National Communications³⁶.

37. In addition, UNDP participates in the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD) with UNEP and the Food and Agriculture Organization (FAO). It is also involved in a number of partnerships including the Global Village Energy Partnership (GVEP), and the Global Network on Energy for Sustainable Development (GNESD) with UNEP.

The United Nations Environment Programme (UNEP)³⁷

38. As the United Nations environment arm, an Implementing Agency of the Instrument for the Establishment of the Restructured Global Environment Facility, co-founder of the Intergovernmental Panel on Climate Change (IPCC) with the World Meteorological Organization (WMO), and supporter of the negotiations that led to the UNFCCC, UNEP occupies a unique position in the United Nations constellation of organizations confronting the challenge of climate change. In addition to supporting these scientific and legal mechanisms, the work of UNEP on climate change has focused on efforts to reduce GHG emissions mainly by promoting renewable sources of energy and improved energy efficiency, and by encouraging the development of a carbon market. It further supports efforts to reducing the risks of and improving society's resilience to climate change.

39. In working to mitigate climate change, UNEP is facilitating the transfer and financing of renewable energy and energy efficiency technologies, facilitating the application of the CDM in new sectors and countries, and fostering the development of a broader and more inclusive carbon market. The work of UNEP's programme on environmental technology assessment focuses on increasing trade in ESTs, and on local project development aimed at developing clean energy funds and energy service companies. Its Bioenergy Programme provides technical support to the Roundtable on Sustainable Biofuels and the Global Bioenergy Partnership. Other programmes, such as the Mediterranean Renewable Energy Programme (MEDREP), the Sustainable Buildings and Construction Initiative, the Sustainable Transport Programme, the Global Market Transformation for Efficient Lighting Programme and the Global Solar Water Heater Market Transformation and Strengthening Initiative, foster cleaner and more efficient technologies in their respective sectors. The Network of National Cleaner Production Centres is a joint effort by UNIDO and UNEP to improve resource efficiency. UNEP also works with private sector enterprises in the building and construction industry to promote more energy efficient buildings and with automobile manufacturers, oil companies and local authorities to promote more efficient transport policies.

³⁵ <http://www.undp-adaptation.org/portfolio/>.

³⁶ <http://www.adaptationlearning.net/>.

³⁷ The primary website and links to relevant web pages and documents can be found at: <http://www.unep.org/climatechange/>.

40. UNEP's technology financing initiatives include the Rural Energy Enterprise Development Initiative (REED) that has nurtured more than 50 new clean energy enterprises in developing countries, the Seed Capital Assistance Facility jointly implemented with the Asian Development Bank and the African Development Bank, and the Sustainable Energy Finance Initiative (SEFI), which has spawned a network of public finance institutions called the SEF Alliance, as well as innovative bank loan programmes.

41. Through its Risø Centre on Energy, Climate and Sustainable Development, UNEP provides technical and financial support to developing countries to help them participate in CDM projects and other international efforts to address climate change and promote sustainable development. The Capacity Development for the Clean Development Mechanism (CD4CDM) projects implemented jointly with UNDP, the World Bank and UNIDO are currently assisting 32 developing countries. The Centre also facilitates the participation of developing countries in the emerging carbon market through its Energy and Carbon Finance Programme.

42. UNEP is also strongly involved in the operations of two networks that support the transition to renewable sources of energy: the Global Network on Energy for Sustainable Development (GNESD), which is a collaboration of more than 20 centres of excellence in both developing and industrialized countries, and the Renewable Energy Policy Network for the 21st Century (REN21). Technology transfer also forms a component of the joint UNEP-UNDP-FAO Programme on Reducing Emissions from Deforestation and Degradation in Developing Countries (UN-REDD), particularly through capacity-building.

43. UNEP's contribution to the adaptation efforts of the United Nations system include:

- assessments of vulnerabilities and adaptation services;
- adaptation measures to increase resilience;
- helping to support and strengthen policies, knowledge and institutional capacity;
- the development of national economic, legal, institutional and regulatory frameworks that integrate climate change concerns;
- integrating adaptation into national development planning; and
- providing technical, analytical and policy support to major climate change financing mechanisms.

Technology transfer plays an important role in a number of UNEP initiatives for adaptation including:

- the Assessments of Impacts and Adaptations to Climate Change Initiative,
- the Highland-Lowland Partnership for Climate Change Adaptation and Disaster Risk Reduction, and
- the development of a Global Climate Change Adaptation Network.

In addition to UNEP projects funded under the GEF, the SCCF and the LDCF, UNEP provides a number of relevant workshops and training activities under these initiatives, such as the programme for assisting in the development of NAPAs.

44. UNEP issued many relevant publication, including its recent “Assessment of Policy Instruments for Reducing Greenhouse Gases from Buildings”³⁸. UNEP also offers a range of tools that are accessible on-line from the Sustainable Energy Finance Directory³⁹, including the set of SEFI Environmental Due Diligence Guidelines⁴⁰, and the Renewable Energy Insurance Training Kit⁴¹.

The World Meteorological Organization (WMO)⁴²

45. The contribution of the WMO to the climate change issue has been seminal, as it was the WMO with UNEP that, more than two decades ago, established the IPCC, which has since then alerted the world to the climate change crisis.

46. The technology transfer activities of the WMO relate to climate and meteorological observation technologies and associated training and capacity-building under such programmes as the World Weather Watch Programme, the World Climate Programme, the Atmospheric Research and Environment Programme, the Applications of Meteorology Programme, the Hydrology and Water Resources Programme and the Disaster Risk Reduction Programme. Other WMO contributions include co-sponsorship of the World Climate Research Programme, the Global Climate Observing System (GCOS)⁴³ and the Global Ocean Observing System.

The Intergovernmental Panel on Climate Change (IPCC)⁴⁴

47. While the main activity of the IPCC is the preparation of its regular technical Assessment Reports, it also prepares focused studies, some of which relate to technology transfer. One of these deals with “Methodological and Technological Issues in Technology Transfer”⁴⁵ and another focuses on methodological tool: the “IPCC Guidelines for National Greenhouse Gas Inventories”⁴⁶ (2006). The IPCC is currently preparing two special reports. One deals with “Renewable Energy Sources and Climate Change Mitigation” that will examine such factors as technological feasibility, economic potential and market status, and economic and environmental costs and benefits in considering the mitigation potential of these sources. The other report focuses on “Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation”.

³⁸ Accessible at: http://www.unep.org/themes/consumption/pdf/SBCI_CEU_Policy_Tool_Report.pdf.

³⁹ <http://www.sefi-directory.net/>.

⁴⁰ Separate guidelines for biomass systems based on energy crops, biomass systems based on agricultural and forestry waste, wind energy systems, solar photovoltaic energy systems, solar thermal energy systems, geothermal energy systems and small-scale hydroelectric energy systems are accessible at <http://sefi.unep.org/english/home/publications-download.html>.

⁴¹ <http://sefi.unep.org/english/home/insurance-online-training.html>.

⁴² The primary website and links to relevant web pages and documents can be found at: http://www.wmo.int/pages/index_en.html.

⁴³ The primary website and links to relevant web pages and documents can be found at: <http://www.wmo.ch/pages/prog/gcos/index.php?name=about>.

⁴⁴ The primary website and links to relevant web pages and documents can be found at: <http://www.ipccc.ch>.

⁴⁵ Accessible at: <http://www.ipcc.ch/pdf/special-reports/spm/srtt-en.pdf>.

⁴⁶ Accessible at: <http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html>.

The United Nations Industrial Development Organization (UNIDO)⁴⁷

48. UNIDO's specialized competence derives from extensive experience in managing technological change based on the promotion and application of new emerging technologies, management systems, and product, process and service innovations. Its ongoing and planned initiatives address a wide range of technology-related issues and foster transfer of equipment as well as knowledge and experience. They include in-country technical and advisory capacity, such as centres, networks and support for professional training, information dissemination, technical assistance, project finance, and technology development, transfer and deployment. UNIDO has a strong focus on assisting countries in building or strengthening their national innovation systems.

49. Although not always the primary focus, many of UNIDO's programmes include a technology transfer component. This is particularly true for its programmes focusing on energy efficiency, renewable energy for productive uses, Small Island Developing States and technology centres. These programmes comprise over 70 projects worth US\$ 130 million. UNIDO has been appointed as the lead agency for the energy component of the GEF Strategic Programme for West Africa and will directly implement eight projects of this programme. GEF funding for the overall programme amounts to US\$ 45 million, which is complemented by over US \$ 200 million of co-financing. Further, UNIDO is in charge of 5 out of 14 technology transfer pilot projects, which are funded by the GEF under its Poznan Strategic Programme on Technology Transfer. Total GEF funding for these 5 projects amounts to US\$ 30 million, which leveraged co-financing of almost US\$ 70 million. Technology transfer also plays an integral role in UNIDO's work in support of its role as an Implementing Agency of the Multilateral Fund of the Montreal Protocol.

50. Of particular importance for the development and transfer of technologies for mitigation and adaptation to climate change among the activities of UNIDO is the focus on national and regional technology centres. These include the joint programme with UNEP to establish National Cleaner Production Centres/Programmes⁴⁸, which currently covers activities in over 40 developing countries and countries with economies in transition to assist businesses with assessment and introduction of cleaner technologies. This programme is being extended to resource-efficient and cleaner production with a specific focus on the enhancement of national capacities to facilitate and manage the transfer, adaptation and replication of ESTs and sustainable product development. Moreover, UNIDO established Centres of South-South Cooperation⁴⁹ in some of the more advanced developing countries in order to create and strengthen the technical and business capacities of developing countries and with technology transfer, management and upgrading of skills as key areas of activity. UNIDO operates a network of eleven Technology Centres⁵⁰, which, implemented as fully integrated parts of existing organizations, promote the development, transfer and use of innovative

⁴⁷ The primary website and links to relevant web pages and documents can be found at:

<http://www.unido.org/index.php?id=071841>.

⁴⁸ <http://www.unido.org/ncpc>

⁴⁹ <http://www.unido.org/index.php?id=1000068>

⁵⁰ Examples include the Regional Centres for Small Hydropower in India, Nigeria and China, the International Centre for Promotion and Transfer of Solar Energy (ISEC) in China and the UNIDO International Centre for Hydrogen Energy Technology in Turkey. For more information refer to <http://www.unido.org/index.php?id=1000399>

technologies. Each centre usually focuses on one specific technology area ranging from small hydropower to hydrogen energy technology. UNIDO also has a programme of Business Information Centres designed to use information and communication technologies (ICTs) and relevant business information for the development of local entrepreneurial skills.

51. Among the many networks of UNIDO, in addition to the networks of technology centres mentioned previously, three are particularly relevant⁵¹:

- a network of thirteen Investment and Technology Promotion Offices (ITPOs) that promote industrial investment projects and international industrial partnerships including value-added services throughout the entire investment promotion cycle;
- the network of Subcontracting and Partnership Exchanges to assist local enterprises in meeting the challenges of globalization and taking advantage of the emerging opportunities that evolve from industrial subcontracting, outsourcing and supply chain requirements; and
- the 40-member nation Africa Investment Promotion Agency Network to develop strategies for enhancing the inflows and effectiveness of foreign direct investment.

The centres and related networks, both national and regional, provide services to businesses and individuals that promote the development and deployment of low-carbon technologies and practices.

52. UNIDO is engaged in several studies, which assess the potential role of such networks and centres to further enhance their support to low-carbon technologies: UNIDO partners with infoDev, a World Bank facilitated financing programme, on a study on climate technology innovation centres. This study aims to produce a deeper and broader understanding of such centres and their relevance to developing countries. Complementary to this top-down analysis, UNIDO currently undertakes two bottom-up studies on low-carbon technology innovation and diffusion centres in Asia. These studies will demonstrate the potential of existing centres and networks to initiate, catalyze and accelerate the development, deployment and dissemination of low-carbon technologies.

53. UNIDO has a long history of providing technical assistance in strengthening capacities and skills at various levels in the area of management of technology through its Technology Promotion Programme, which focuses on promoting the transfer of technology to developing economies. UNIDO also has a Technology Foresight Programme⁵² to support the technology development process by taking into consideration future risks such as the effects of climate change, and providing inputs for the formulation of technology policies and strategies that guide the development of technological infrastructure and support innovation, incentives and assistance for technology management and transfer. Through its Technology Management and Innovation Systems Programme, UNIDO provides support for decision-making concerning the application of technology and innovation for sustainable and competitive economic and industrial policies, including technology dissemination, national innovation systems and technology capacity-building, to achieve a productive capacity that emphasizes both efficiency and a low-carbon economy.

⁵¹ <http://www.unido.org/index.php?id=018264>

⁵² <http://www.unido.org/index.php?id=05216>

54. UNIDO has a strong focus on capacity-building activities, especially through its Energy Efficiency Programme, Renewable Energy Programme, and CDM and JI projects. In addition, UNIDO is operating or developing a variety of specialized training activities to prepare developing countries for the transfer of technologies for mitigating and adapting to climate change. These include a range of training activities in methodologies and tools, from industrial energy system optimization to trainings for technology transfer project preparation and financing carried out in collaboration with the UNFCCC Secretariat, as well as the Bioenergy Capacity Building Programme (BIOCAB).

55. UNIDO also continues to develop a number of specialized tools for promoting the transfer of technologies for mitigating or adapting to climate change, many of which can be accessed on-line, such as:

- the planned Biomass Conversion Technology On-line Platform (BIOTIP) to provide information on the technical details, costs and economics, experiences and suppliers of commercially available bioenergy technologies;
- the International Clean Energy Analysis Portal, developed with the US Department of Energy's National Renewable Energy Laboratory⁵³;
- a computer cash-flow oriented software package called COMFAR III Expert containing a methodology for feasibility analysis, preparation, reporting and appraisal for projects;
- a planned competitive analysis programme to assist a country identify those sectors and products with the greatest competitive potential to ensure that local policies and financial resources, as well as technical assistance resources, are directed where their impact will be most effective;
- an Investment Monitoring and Management Platform currently being developed to offer African nations data and analysis on domestic companies and foreign investors⁵⁴; and
- a platform called PLATECH⁵⁵ that supports the development of technology parks in newly industrializing countries by providing on-line counselling, e-learning tools for their establishment and development, and networking services to facilitate technical and commercial cooperation.

56. Relevant UNIDO publications⁵⁶ include “Navigating Bioenergy: Contributing to informed decision making on bioenergy issues”, the UNIDO “Manual on Technology Transfer Negotiations”, “Negotiating the Transfer and Acquisition of Project-based Carbon Credits under the Kyoto Protocol”, the “Manual for the Preparation of Industrial Feasibility Studies”, the “Manual for the Evaluation of Industrial Projects” and “Guidelines for Infrastructure Development through Build-Operate-Transfer (BOT) Projects”. As one of its contributions to the Global Bioenergy Partnership (GBEP) in the context of technology transfer, UNIDO is developing a report on the “Deployment of Technologies for Sustainable Bioenergy: Towards an agenda for international cooperation” with a focus on the development status of bioenergy technologies, their realizable future potential, and the barriers that need to be removed and the driving forces to be activated through international cooperation.

⁵³ http://en.openei.org/wiki/Gateway:International_Clean_Energy_Analysis

⁵⁴ <http://www.unido.org/index.php?id=7185>.

⁵⁵ <http://www.unido.org/index.php?id=5454>.

⁵⁶ <http://www.unido.org/index.php?id=1000076>.

57. Finally, UNIDO undertakes other global outreach efforts in the area of energy and climate change notably through global forum activities and expert group meetings that bring together planners, experts and entrepreneurs and facilitate information dissemination, sharing of lessons learned and exchange of ideas.

Department of Economic and Social Affairs of the United Nations Secretariat (UN-DESA)⁵⁷

58. One of the primary contributions of UN-DESA in recent years is the organization of major global high-level events to promote dialogue and cooperation and to provide a forum for the exchange of ideas and for advancing important initiatives on technology development and transfer in the context of sustainable development. This has the ultimate objective of supporting intergovernmental negotiations and creating awareness of the importance of technology transfer and of international cooperation. Background papers prepared for these events, such as “Climate Change: Technology development and technology transfer”⁵⁸ published in 2008 and “Climate Change: Technology development and transfer”⁵⁹ published in 2009, help to create awareness and provide an up-to-date summary of the major issues.

59. UN-DESA serves as the secretariat for the United Nations Commission on Sustainable Development (UNCSD) and for the United Nations Forest Forum, which addresses the issue of deforestation and forest degradation. During its second Implementation Cycle (2006-2007), the UNCSD undertook a review and assessment of progress toward sustainable development for, among other issues, technology transfer in the relevant areas of climate change, air pollution/atmosphere and energy. At that time a Matrix⁶⁰ of implementation activities was developed and utilized by the UNCSD as an information tool for these three relevant areas. The Matrix provides case studies of practical experience in overcoming barriers and constraints to technology transfer, among other issues. UN-DESA also maintains a Case Study Database⁶¹ that contains details of relevant projects that involve technology transfer.

60. Having implemented many UNDP and GEF projects, including many to promote renewable energy technologies in China, India and numerous other countries over several decades, UN-DESA has direct experience with the value of technology transfer. Therefore, it undertakes a diverse set of activities in support of technology development and transfer in the context of climate change. Recent UN-DESA global conferences on this topic include the Beijing High-level Conference on Climate Change in November 2008 and the Delhi High Level Conference on Climate Change in October 2009. The UN-DESA, jointly with UNIDO, organized a side event on technology development and transfer for the fifteenth session of the COP in Copenhagen, Denmark in December 2009.

⁵⁷ The primary website and links to relevant web pages and documents can be found at:

<http://www.un.org/esa/desa/climatechange/>.

⁵⁸ United Nations, Climate Change: Technology Development and Technology Transfer, 08-00077, New York (2008).

⁵⁹ United Nations, Climate Change: Technology Development and Transfer, 09-00072, New York (2009).

⁶⁰ Accessible at: <http://www.un.org/esa/sustdev/csd/csd14/matrix.htm>.

⁶¹ Accessible at: http://www.un.org/esa/dsd/csd/csd_casestud.shtml.

61. Also, in 2009, UN-DESA launched a Development Account Project on “Integrating Climate Change into National Sustainable Development Strategies and Plans in Latin America and the Caribbean”, which identifies technology transfer as a major component of any integrated national sustainable development strategy that deals with climate change. The project provides an in-depth analysis of climate change technology transfer barriers and potential policies and actions to overcome these barriers. It is designed to generate analytical tools for assessing technology barriers and mechanisms, and for supporting the mainstreaming of climate change and, in particular adaptation, into National Sustainable Development Strategies and national development plans.

62. UN-DESA also builds on publications to promote technology development and transfer in the context of climate change. Notable among its recent publications is the “World Economic and Social Survey 2009: Promoting development, saving the planet”⁶², which is entirely devoted to issues in the context of climate change including the important role that technology development and transfer can and should play in mitigation and adaptation actions and in promoting development. Further, three of UN-DESA’s recent Policy Briefs address technology transfer, focusing on “Climate Change and Technology Transfer: The need for a regional perspective”, “Technology Transfer and Climate Change: Beyond TRIPS” and “Financing Mitigation and Adaptation by Developing Countries”⁶³. Also in 2009, UN-DESA developed a proposal contained in a Technical Note on “A Global Green New Deal for Climate, Energy and Development”⁶⁴, which outlines a strategy to rapidly increase the installed capacity of renewable energy systems through a globally coordinated programme of accelerated public and private investment in conjunction with feed-in tariffs as a means to sharply reduce costs, motivate technology improvements and advance the learning curve.

63. A valuable tool provided by UN-DESA is the platform for Partnerships for Sustainable Development registered with the UNCSD⁶⁵. This is a major venue for collaboration among United Nations system organizations and with other stakeholders. UN-DESA also provides on-line tools for members of these partnerships and a directory describing each of them.

⁶² United Nations, New York (2009).

⁶³ Accessible at: <http://www.un.org/esa/policy/policybriefs/>.

⁶⁴ Accessible at:

http://www.un.org/esa/dsd/resources/res_pdfs/publications/sdt_cc/cc_global_green_new_deal.pdf.

⁶⁵ http://www.un.org/esa/dsd/dsd_aofw_par/par_index.shtml.

The Regional Economic Commissions

64. The five regional economic commissions were established to encourage economic cooperation among their member states. These agencies are

- the Economic Commission for Africa (ECA)⁶⁶,
- the Economic Commission for Europe (ECE)⁶⁷,
- the Economic Commission for Latin America and the Caribbean (ECLAC)⁶⁸,
- the Economic and Social Commission of Asia and the Pacific (ESCAP)⁶⁹ and
- the Economic and Social Commission for West Asia (ESCWA)⁷⁰.

All of these agencies provide advisory services and undertake technical cooperation projects that involve renewable energy and/or energy efficiency, often with technology transfer and capacity-building components.

65. A particularly relevant programme of the ECA Science and Technology Network is the programme of Global Climate Change and Africa Science Activities with some of the ongoing projects targeted at building capacity to undertake climate change research within the region.

66. Most of the technology transfer activities undertaken by the ECE are in south-eastern Europe, Eastern Europe and Central Asia. Energy efficiency is the primary focus of many relevant ECE activities. ECE promotes the formation of an energy efficiency market to foster cost-effective investments, which can provide a self-financing method for reducing GHG emissions. Countries in the region receive assistance to address the financial, technical and policy barriers to energy efficiency and renewable energy investments. This work is implemented in the framework of the Energy Efficiency 21 (EE21) Programme and includes ten regional, sub-regional and inter-regional projects and interdivisional cooperation activities. Among them are projects on the development of renewable energy sources in the countries of the Commonwealth of Independent States, the Global Energy Efficiency 21 Project, which promotes regional cooperation including on technology issues, the ECE Action Plan on Energy Efficiency in Housing, and several projects in south-eastern Europe on wood energy and the efficient use of energy and water, as well as activities of the Regional Adviser on Energy. Outreach, expert group meetings and workshops, policy seminars, training and capacity-building activities, and publications are important components of the EE21 Programme. The largest of the EE21 activities is a project on Financing Energy Efficiency Investments for Climate Change Mitigation, which began in 2008 and is intended to assist participating countries in enhancing energy

⁶⁶ The primary website and links to relevant web pages and documents can be found at: http://uneca.org/estnet/African_projects/African_SandT_projects.htm.

⁶⁷ The primary website and links to relevant web pages and documents can be found at: <http://unece.org/Welcome.htm>.

⁶⁸ The primary website and links to relevant web pages and documents can be found at: <http://www.eclac.org/default.asp?idioma=IN>.

⁶⁹ The primary website and links to relevant web pages and documents can be found at: <http://www.greengrowth.org/>.

⁷⁰ The primary website and links to relevant web pages and documents can be found at: <http://www.escwa.org.lb>.

efficiency and reducing air pollution and GHG emissions in order to meet their international obligations under the UNFCCC and ECE environmental conventions.

67. With regard to coal mine methane, the ECE promotes recovery and use of methane from coal mines to minimize emission of this GHG and contribute to climate change mitigation. One ECE activity in this area reviews prospects for cleaner electricity generation from coal and other fossil fuels, and measures or incentives to promote investment in cleaner electricity production. This work assesses regulatory needs for promoting investment and technology transfer in cleaner electricity generation from fossil fuels, appraises the comparative advantage of investments in new capacities and analyses issues related to carbon capture and storage technologies, especially in the context of the emerging economies in the ECE region.

68. The range of activities of ESCAP on climate change include workshops on TNAs, the development of a CDM guidebook for local governments, assistance to local governments in the development of CDM-related projects through the Kitakyushu Initiative for Clean Environment, and the promotion of energy efficiency through the Green Growth Programme.

The United Nations Conference on Trade and Development (UNCTAD)⁷¹

69. UNCTAD's main role in addressing climate change is to help developing countries master the resulting trade and development implications and take advantage of emerging trade and investment opportunities. Its Climate Change Programme addresses trade and economic aspects of climate policies, biofuels and the CDM through information exchange, analytical studies, expert meetings and workshops.

70. The UNCTAD Biofuels Initiative promotes the production of clean-burning, carbon-neutral fuels derived locally from sustainable agricultural practices by providing interested countries with access to sound economic and trade policy analysis and capacity-building activities.

71. Recent UNCTAD meetings include an Expert Meeting on Maritime Transport and the Climate Change Challenge, and an Expert Meeting on Trade and Climate Change that addressed trade and investment opportunities under the CDM. UNCTAD organized a panel on "New and Emerging Renewable Energy Technologies" in November 2009 in its role as the Secretariat for the United Nations Commission on Science and Technology for Development (UNCSTD), and an Expert Group Meeting on Green and Renewable Energy Technologies in February 2010. Both of these activities will consider the role of policy in stimulating technology development and transfer, as well as the importance of capacity-building.

72. As a result of its work on developing training material on the rules of the CDM, UNCTAD launched the 2009 edition of its "Guide to the Clean Development Mechanism (CDM)". UNCTAD uses this material as the basis for developing capacities for participating in CDM projects in selected countries through its Programme on Clean Development Mechanism in Least Developed Countries.

⁷¹ The primary website and links to relevant web pages and documents can be found at: <http://www.unctad.org/Templates/StartPage.asp?intltemID=4342>.

The Food and Agriculture Organization (FAO)⁷²

73. FAO plays an important role in assisting developing countries with climate change issues related to food security, reducing emissions from agriculture and REDD. FAO's programme on climate change focuses on promoting practices for the mitigation and adaptation of agricultural systems, reducing emissions from the agricultural sector, developing practices aimed at reducing vulnerability and increasing the resilience of agricultural systems to climate change, strengthening national and regional climate observing systems and networks, and handling climate risk management in agriculture.

74. As a result, FAO's climate change activities cover projects in agriculture, livestock, forestry, fisheries, bioenergy, biological diversity and climate change risk management. In addition to addressing the climatic aspects of food production with its programmes and tools, FAO is also promoting the development of new crop strains that can flourish under the changed climatic conditions anticipated and new post-harvest food technologies. FAO also participates in the UN-REDD programme with pilot projects in nine countries. Some of the climate change projects in these programmes include a technology transfer component.

75. FAO provides a wide range of data and tools for assessing climate change impacts and vulnerabilities, and adaptation and mitigation planning related to agriculture and food security. FAO's global databases on crop requirements, soil, water and climate, and its models for assessing crop cultivation suitability will be important tools for adapting agricultural systems to the changing climate. Many of the database, methodological, training, guidebook and software tools provided by FAO, including the Technologies for Agriculture database (TECA)⁷³, are now organized on a convenient integrated platform for Climate Impact on Agriculture (CLIMPAG)⁷⁴. Finally, the Field Programme Management Information System is an important tool for accessing details concerning all FAO field projects⁷⁵.

76. Two recent FAO publications addressing agricultural aspects of climate change, although only indirectly related to technology transfer, are "Adaptation to Climate Change in Agriculture, Forestry and Fisheries: Perspective, framework and priorities", and the more technical "Terrestrial Essential Climatic Variables for Climate Change Monitoring, Mitigation and Adaptation".

The World Intellectual Property Organization (WIPO)⁷⁶

77. With intellectual property rights being of great importance to discussions on technology transfer, the role of WIPO is essential for guiding the international community in the transfer of

⁷² The primary website and links to relevant web pages and documents can be found at: <http://www.fao.org/climatechange/en/>.

⁷³ <http://www.fao.org/teca/research>.

⁷⁴ <http://www.fao.org/nr/climpag/>.

⁷⁵ <http://www.fao.org/tc/tcom/>.

⁷⁶ The primary website and links to relevant web pages and documents can be found at: <http://www.wipo.int/portal/index.html.en>.

technologies to assist developing nations in adapting to and contributing to mitigating climate change.

78. Although not specific to the issue of climate change, WIPO has published a pertinent document that can provide useful insights for the acceleration of technology transfer and for capacity-building, namely “Technology Transfer, Intellectual Property and Effective University-Industry Partnerships”⁷⁷. This document explores the experiences of countries in East and South Asia. WIPO also provides PATENTSCOPE, an internet portal for patents and patent-related resources⁷⁸.

Other organizations

79. Other organizations that also are engaged in activities and make important contributions in their areas of expertise and responsibility in support of technology transfer in the context of climate change are included in Table 2.

Table 2. Other Organizations of the United Nations Involved in Technology Transfer in the Context of Climate Change

Acronym	Organization
CBD	Convention on Biological Diversity
GCOS	Global Climate Observing System
ICAO	International Civil Aviation Organization
IAEA	International Atomic Energy Agency
IFAD	International Fund for Agricultural Development
ILO	International Labour Organization
IMO	International Maritime Organization
IMF	International Monetary Fund
ISDR	International Strategy for Disaster Reduction
ITU	International Telecommunication Union
OCHR	Office of the Commissioner for Human Rights
UNCSD	United Nations Commission on Sustainable Development
UNCCD	United Nations Convention to Combat Desertification
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNHCR	United Nations High Commissioner for Refugees
UN-HABITAT	United Nations Human Settlements Programme
UNITAR	United Nations Institute for Training and Research
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
UNPF	United Nations Population Fund
UNU	United Nations University
WFP	World Food Programme
WHO	World Health Organization
WTO	World Tourism Organization

⁷⁷ Accessible at: http://www.wipo.int/freepublications/en/intproperty/928/wipo_pub_928.pdf

⁷⁸ <http://www.wipo.int/pctdb/en/>.

III. Joint efforts and partnerships

80. The CEB set up a useful inter-agency mechanism for providing access to information about the programmes and projects within the United Nations system in the area of climate change. When used to search for technology transfer activities, this Online Inventory of United Nations System Activities on Climate Change⁷⁹ demonstrates the wide range of activities that contribute to the related efforts within the United Nations system. As comprehensive inputs from all relevant organizations of the United Nations system are incorporated into the inventory, it will evolve an increasingly important tool for information sharing as well as cooperation and collaboration.

81. UN-Energy and UN-Water, two inter-agency mechanisms, were established to help ensure coherence of actions within the United Nations system. They aim to promote system-wide collaboration in the area of energy and water, as there is no single entity in the United Nations system that has primary responsibility in these areas. Their role is to increase sharing of information, encourage and facilitate joint programming and develop action-oriented approaches to coordination. Both of these bodies are focusing some of their efforts on issues related to climate change including technology development and transfer. Recent relevant UN-Energy publications⁸⁰ include “Delivering on Energy – An overview of activities by UN-Energy and its members”, “Policies and Measures to realise Industrial Energy Efficiency and mitigate Climate Change”, “Sustainable Bioenergy: A framework for decision makers” and “Assessing Policy Options for Increasing the Use of Renewable Energy for Sustainable Development: Modelling energy scenarios for Ghana and Sichuan Province of China”. UN-Water has established a Task Force on Climate Change to begin examining the climate change issues in various water-related sectors.

82. There are many activities being undertaken jointly by one or more organizations of the United Nations system that promote technology development and transfer in the context of climate change. One relevant activity is the World Bank-supported infoDev and UNIDO study on climate technology innovation centres, which aims to produce a deeper and broader understanding of such centres and their relevance to developing countries. Further, many of the projects and other activities financed through the GEF, whether from the GEF Trust Fund, LDCF or the SCCF, are being implemented jointly by the GEF and one or more of its agencies: FAO, IFAD, UNDP, UNEP, UNIDO, the World Bank and the four regional development banks.

83. There are numerous other examples of joint activities including the

- UNEP-WMO collaboration that produced the IPCC;
- UNDP-UNEP-FAO Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD);
- UNDP-UNEP Global Network on Energy for Sustainable Development (GNESD);
- engagement of UNDP, UNEP, UNIDO and the World Bank in the advisory body of the Capacity Development for CDM (CD4CDM) programme;
- UNIDO-UNEP Network of National Cleaner Production Centres/Programmes;

⁷⁹ <http://www.un.org/climatechange/projectsearch/index.asp>.

⁸⁰ <http://esa.un.org/un-energy/Publications.htm>

- World Bank-UNDP Energy Sector Management Assistance Program (ESMAP); and the
- UNFCCC Secretariat-EGTT-UNDP collaboration on the “Conducting Technology Needs Assessment for Climate Change” handbook.

Moreover, many of the operational activities of the EGTT involve collaboration with the UNFCCC Secretariat and other United Nations system organizations such as ESCAP, UNDP, UNEP, UNIDO and UNITAR, especially in organizing regional TNA workshops and convening expert workshops.

84. In undertaking activities involving technology transfer and capacity-building related to climate change, United Nations system organizations individually or jointly often collaborate with other international organizations, NGOs, governments, foundations and private corporations. Many of these ventures are enlisted in the Partnerships for Sustainable Development registry, launched at the World Summit on Sustainable Development in Johannesburg, South Africa, in 2002. UN-DESA manages the registration of these partnerships and maintains a website that provides information on each of them⁸¹. Some of the relevant partnerships are truly broad. For example, the Methane to Markets Partnership involves twenty governments, 175 corporations and NGOs, the World Bank and the ECE as well as the Asian Development Bank, and the Renewable Energy and Energy Efficiency Partnership (REEEP) involves 44 governments, 180 corporations and NGOs, UNIDO and UNEP, as well as the African Development Bank, the European Union and the Organization of American States. Another example is the Global Bioenergy Partnership (GBEP), which involves 12 governments, FAO, UNIDO, UNEP, UNCTAD, UN-DESA, UNDP, the International Energy Agency (IEA), the European Biomass Industry Association and the United Nations Foundation.

85. Examples of further relevant Partnerships for Sustainable Development involving United Nations organizations and addressing technology development and transfer as part of their activities are included in Table 3.

⁸¹ See http://www.un.org/esa/dsd/dsd_aofw_par/par_index.shtml for a complete list and detailed information on each partnership.

Table 3. Selected Relevant Partnerships for Sustainable Development

Partnership	Participating UN Organization(s)
Small Island Developing States Partnership for the Implementation of New Technologies for Sustainable Development	UN-DESA
Asia-Pacific Forum for Environment and Development Partnership Initiatives for Knowledge Network and Capacity Building (APFED) ⁸²	UNEP, ESCAP
Caribbean Adaptation to Climate Change and Sea Level Rise Partnership	ECLAC, UNDP, UNEP
Enhancement of Regional Strategy on Climate Change through the Asia-Pacific Network on Climate Change (AP-Net)	ESCAP
Global Network on Energy for Sustainable Development	UNEP, UNDP, UNFIP
Global Village Energy Partnership (GVEP)	UNDP, World Bank, UNEP
Improving the Provision of Sustainable Energy Services for Small Island Developing States	UNDP, UNEP, GEF, UN-DESA
Market Facilitation Partnership for Concentrating Solar Power Technologies ⁸³	UNEP
Mediterranean Partnership for Sustainable Energy Development (MEDITEP)	UNEP
Mediterranean Renewable Energy Programme (MEDREP)	UNEP
Pacific Islands Energy for Sustainable Development Partnership (PIESD)	UNDP, UNESCO, UNEP, World Bank, ESCAP, UN-DESA
Partnership for Clean Fuels and Vehicles	UNEP, UN-DESA
Partnership on Sustainable, Low Carbon Transport ⁷⁷	UNEP, UN-DESA, UN Centre for Regional Development
Global Sustainable Energy Island Initiative Partnership	UNIDO, UNFIP
Sustainable Energy for Sustainable Development in the Caribbean Partnership	UNEP, UNDP, GEF

86. However, there are many other forms that partnerships with United Nations system organizations can take. For example, many carbon funds and facilities managed by the World Bank involve partnerships with a government. Similarly, the regional development banks are partners of the World Bank in implementing CIF activities of their region. Further, a frequent international partner in the work of the UNFCCC Secretariat and EGTT is the Climate Technology Initiative supported by the IEA.

87. In addition, UNIDO has many institutional and corporate partners for its Centres for South-South Cooperation, its Business Information Centres and its ITPOs. Finally, United Nations system organizations that are involved in supporting CDM activities are generally part of a partnership.

⁸² Supported by the Government of Japan.

⁸³ Supported by the Government of Germany.

IV. Opportunities for enhancing technology development and transfer activities

88. A review of United Nations activities that promote technology development and transfer in the context of climate change indicates that opportunities exist for enhancing this critical area. On the basis of available information, some potential issues emerge that would further support the technology development and transfer efforts within the framework of priorities of the Bali Action Plan. These issues, summarized below, are presented as a starting point for further discussion and are not intended to constitute a comprehensive analysis of all the potential fields for engagement by the organizations of the United Nations system.

Technology needs and needs assessment

89. While there are still countries that have yet to submit TNAs, the GEF financially supports countries in preparing and updating their TNAs and funds services by United Nations agencies to support them in their work, like trainings. For example, a current GEF-supported project implemented by UNEP aims to support 35 to 45 countries with GEF grant financing of US\$ 9 million to carry out improved TNAs.

90. However, a major issue is the continuing disconnect between the assessment process and the means of implementation to address the needs assessed. This might be addressed to some extent through a comprehensive register of the needs identified and the subsequent actions taken for all countries preparing or updating their TNAs. Such a register could aid some donors in targeting the issues or nations they would prefer to assist.

Technology information

91. Several organizations of the system have set up mechanisms to provide information on ESTs and adaptive technologies. There are also several focused technology information websites maintained by specialized agencies. Moreover, the continuing development of networks of technology information centres holds promise for meeting rising expectations in this area.

92. However, the technologies for which information is available from the United Nations system represent only a small fraction of the many technologies, commercial products, techniques and methods currently available for dealing with climate change mitigation and adaptation. Thus, despite the expanding work of the United Nations system, there is need for establishing a comprehensive database for such technologies and products. Just as important as the technical details is information on the conditions for which these technologies and products are applicable and on the ways and means by which they can be accessed.

Enabling environments for technology transfer

93. National governments are the entities primarily responsible for ensuring enabling environments for technology development and transfer in the context of climate change, and the major role of the United Nations system has been one of awareness-raising and promotion through recommendations, information sharing and training activities. Success of the United Nations in this area is dependent upon a number of interrelated factors that are not always easy to assess, but in the case of poorer countries usually strongly relate to the priority governments attribute to according initiatives.

94. Among the United Nations efforts that could be strengthened is the promotion of national and regional markets for ESTs and adaptive technologies, especially within an environment that will foster local production with the eventual aim of endogenous development. While significant national and international public funding is available to assist with the development of some technologies, most product development will have to be done by the private sector and the market place will ultimately determine which technology innovations will succeed. In support of this, government policies can set parameters that will favour environmentally friendly solutions and open possibilities for related foreign direct investments and joint ventures. Indeed, this has been the focus of some GEF, UNDP and World Bank projects that have assisted governments in developing legal frameworks that were subsequently enacted and help provide an enabling environment to accelerate technology transfer and development in this field. Also, it appears that the United Nations system could place more emphasis on promoting the development of comprehensive national plans and international assistance programmes, both of which need to integrate issues of climate change with those of the environment, sustainable development and achieving the MDGs. This will provide an appropriate context for advancing sustainable development as well as mitigating and adapting to climate change.

Financial needs and funding activities

95. In considering financial support for technology development and transfer, it is useful to provide a context for the funds required and available for mitigation and adaptation in developing countries. For these countries, the estimated annual incremental cost for achieving a mitigation target of 450 ppm of atmospheric CO₂ ranges from US\$ 200 billion⁸⁴ to nearly US\$ 1 trillion⁸⁵ and the estimated annual incremental cost for adaptation needs in 2030 ranges from US\$ 17 billion to 97 billion⁸⁶. Although current programmes and funds from all sources provide substantial financial flows to developing countries for mitigation and adaptation, they account for only a portion of the estimated needs. In the period 2006-2010, funds to be provided for mitigation under the UNFCCC amount to nearly US\$ 200 million⁸⁷. For the period 2010-2012, the collective commitment by developed countries is to provide new and additional resources, including for forestry and

⁸⁴ FCCC/TP/2008/7 (26 November 2008).

⁸⁵ Nicholas Stern, *A Blueprint for a Safer Planet: How to manage climate change and create a new era of prosperity*. London: The Bodley Head (2009).

⁸⁶ FCCC/TP/2008/7 (26 November 2008).

⁸⁷ Derived from data in Table VI.3 of the *World Economic and Social Survey 2009: Promoting development, saving the planet*. New York: The United Nations (2009).

investments through international institutions, approaching US\$ 30 billion with balanced allocation between adaptation and mitigation⁸⁸. Funding for adaptation is to be prioritized for the most vulnerable developing countries, such as the least developed countries, Small Island developing states and African nations. Developed countries are also committed to a goal of mobilizing jointly US\$ 100 billion per year by 2020 to address the mitigation needs of developing countries. Although, only a portion thereof is required for technology development and transfer in the context of climate change, it is evident that an effective effort has begun. Also, it must be noted that the UNFCCC and other multilateral funds often leverage co-financing that can substantially increase the funds actually used for mitigation and adaptation activities. Nevertheless, the bulk of the funds needed cannot realistically be expected to be provided through UNFCCC, bilateral and multilateral financing, even with associated co-financing. Therefore, it is essential that ways be found to attract investments from the private sector in order to help meet these needs.

96. The impressive scaling-up of resources and increase in variety of funding sources provided primarily by the GEF and the World Bank for financing technology transfer must be seen in this context. In ongoing activities of United Nations agencies focusing on ESTs, a component involving technology transfer is often included. However, it has not been possible to reliably quantify the technology transfer components of most of these activities. Moreover, it was not possible to identify any GEF- or World Bank-funded projects that focused specifically on technology development, a focus which may well be worth considering.

Innovative options for financing

97. Developing innovative financing options for the development and transfer of technologies forms an important part of efforts to meet the funding needs for mitigation and adaptation in developing countries. In order to scale up investments in this area, the GEF has prepared and launched the Poznan Strategic Programme on Technology Transfer with a US\$ 50 million funding portfolio. This programme supports TNAs, piloting of priority technology projects linked to TNAs, and dissemination of GEF experience and successfully demonstrated ESTs. This will go some way toward addressing the self-identified gaps in GEF financing for technology development and transfer: the weak link between GEF project development and TNAs, lack of adequate reporting and knowledge management on technology transfer activities, uneven engagement with the private sector, and limited synergy with the carbon market. In essence, the Poznan programme addresses only the first two gaps, leaving the other two to be addressed in other ways.

98. While the effort of the United Nations system to support technology development and transfer projects is substantial, broad-based and increasing in magnitude, there is considerable room for enhanced engagement. A globally coordinated programme of accelerated public and private investment in conjunction with feed-in tariffs could serve as a means to sharply reduce costs and motivate technology improvements. The implementation of such a strategy would help significantly increase the installed capacity of renewable energy systems.

⁸⁸ Copenhagen Accord of 18 December 2009 (to be published as a Decision of the COP).

99. It was difficult to identify more than a few significant projects that attracted private financing for transferring, deploying and developing ESTs by directly involving enterprises, such as through joint ventures. Those identified involved mainly GEF-funded projects in China and India. Further, it was not possible to identify any significant effort to promote enterprise and corporate driven R&D, innovation or cost reduction. Therefore, there appears to be room for more private sector involvement on an international level. While it was not possible to identify programmes that provide fully integrated technical assistance to help develop, manage and operate EST addressed at businesses, both UNEP and UNIDO provide important support along these lines, as do the GEF, UNDP and World Bank for projects they finance and manage.

Capacity-building for technology transfer

100. Since the financial flows needed for climate change mitigation and adaptation by developing countries are very large, the financial and technical assistance required to establish the human and institutional capacities to develop and transfer the required technologies are correspondingly significant. United Nations organizations, including the GEF, UNDP, UNEP, UNIDO and the World Bank, are augmenting their financial support directly to meet some of these needs, and increasingly integrate strong capacity building components into new projects and programmes. In support of capacity-building, many organizations now provide application tools, training courses, seminars and workshops related to technology transfer, some of which specifically address technology development and transfer. In addition, the EGTT and UNFCCC Secretariat promote support for capacity-building for technology development and transfer that responds to TNAs.

101. However, it proved difficult to identify efforts by organizations of the United Nations system that resulted in capacity-building through joint research involving researchers from developing countries in institutions of either developing or developed countries.

Promotion of endogenous development

102. While there are examples of GEF and UNDP projects that have led to endogenous technology R&D in developing countries, notably for ESTs in China and India, few projects include a plan for this activity. Moreover, except for institution building efforts, most involvement by United Nations system organizations in the promotion of endogenous development of technology through the provision of financial resources and joint research and development appears to be tangential to other goals. Therefore, this is an area that could benefit from a more focused effort.

Collaborative research and development

103. Since renewable energy technologies remain, by and large, too expensive to motivate a full replacement of fossil fuel-based energy technologies, acceleration of R&D to improve and develop new ESTs is obviously a high priority. To ensure that developing countries have access to technologies that will assist in their mitigation as well as adaptation efforts, they must play an active role in technology development. The promotion of collaborative R&D on technologies can significantly support such a role. Some of the related efforts are also linked to endeavours to establish national

and regional institutions for the endogenous development of technologies, as further discussed under “Technology Centres”.

104. The primary effort by the United Nations system to encourage government promotion for academia-industry cooperation on research programmes to address climate-friendly technologies appears to be through intergovernmental meetings and documentation issued by organizations. While there are a few GEF, World Bank and UNDP projects that promote such cooperation for the development, production and deployment of ESTs, the overall engagement of the United Nations system with regard to the promotion of collaborative R&D was found to be limited to a few countries. A stronger programme in this area may evolve as a result of an EGTT report on options to facilitate collaborative R&D on ESTs, the terms of reference of which are currently being developed. A stronger effort by the United Nations system to facilitate the participation of developing countries in ongoing non-UN international programmes designed to develop ESTs might well be worth exploring.

Technology Centres

105. The goals of capacity-building, endogenous technology development and collaborative R&D are being advanced by the United Nations system through the promotion of and support for centres. Building on ongoing efforts like the infoDev and UNIDO study on “climate technology innovation centres”, the development of such centres at the regional and national levels could be a major contribution of the United Nations system to promoting technology development and transfer in the context of climate change. In such efforts it will be important to ensure that a strong business and entrepreneurial dimension is incorporated into the fabric of the centres. Currently under negotiation among the Parties to the UNFCCC is a proposal for a new Technology Mechanism that could include a Climate Technology Centre and Network to ensure coordination of a wide range of activities and initiatives, including regional and national centres.

Conclusion

106. The United Nations system is currently engaged in a substantial effort, across a broad spectrum of complementary activities, to assist the international community in mitigating and adapting to climate change and especially to better prepare developing nations to adapt to the adverse effects. While the magnitude of this effort is exceptional and many activities are innovative, it will be crucial to make an even more effective use of the wealth of the expertise and experience available within the United Nations system in pursuit of an endeavour that can be achieved only through global cooperation.

