

Technology Transfer Mechanism for Climate Change

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Draft: 24 March 2008

1. Background

1.1 The Bali COP of the UN Framework Convention on Climate Change (UNFCCC) decided that the future negotiating process shall address “enhanced national/international action on mitigation,” as well as enhanced action on adaptation, technology development and transfer, and provision of financial resources and investment. The decision contains detailed lists of issues to be considered under each of these topics. Enhanced action on mitigation includes, *inter alia*, consideration of:

- measurable, reportable and verifiable nationally appropriate mitigation commitments or actions, including quantified emission limitation and reduction objectives by all developed countries, taking into account differences in their national circumstances; and
- nationally appropriate mitigation actions by developing countries in the context of sustainable development supported and enabled by technology, financing and capacity building, in a measurable, reportable and verifiable manner.

1.2 The ultimate success of the UNFCCC and the Kyoto Protocol in mitigating climate change will depend on continuous technological innovation and the rapid and widespread transfer and diffusion of technologies, including ‘know-how.’ Both UNFCCC and the Kyoto Protocol emphasise the need for technology transfer.

2. What Is Technology Transfer?

2.1 Technology transfer is the intentional ‘passing-on’ of technology or know-how from one party to another, commonly by purchase, investment, or agreements for cooperation. There are three distinct components of technology that can be transferred:

- physical assets, such as plants, machinery, and equipment;
- information, both technical and commercial, relating to process know-how, choice of technology, engineering design and plant construction, organization and operating methods, quality control, and market characteristics;
- and human skills, especially those possessed by specialized professionals and engineers. The acquisition and absorption of foreign technologies, and their

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further development, are complex processes that demand significant knowledge and efforts on the part of those that acquire them.

2.2 The IPCC identifies certain stages in technology transfer, but notes that they do not always occur in a linear fashion. Stages include the identification of needs (assessment), choice of technology, negotiation of conditions of transfer, agreement, implementation, evaluation and adjustment to local conditions, and replication. These stages appear regardless of whether the technology transfer is driven by governments, the private sector, or communities.

3. Elements of a Technology Transfer Mechanism (TTM) for climate change

3.1 A single-window facility

At present there are many mechanisms promoting voluntary action in developing countries, including the Global Environmental Facility (GEF), bilateral donors, UN organizations, NGOs, and private emissions trading enterprises. Considerable donor and private money flows into these organizations, but so far overhead and profits are incredibly high and there are few measurable outcomes of the mechanisms. The activities are dispersed, uncoordinated, and with no long term goals or strategy. The TT mechanism has to be the focal organisation and a single-window facility (like the financial mechanism of the Montreal Protocol) through which all the programmes of all the agencies pass through. Only this will avoid duplication and devote all the resources available to achieve agreed country goals. The Donors have to assure that the TT mechanism will continue to function as long as necessary to achieve the agreed country goals and that they will provide the necessary resources periodically. To enable donors to give such an assurance, all countries need to agree on many essential elements as detailed below.

3.2 Eligibility of countries for assistance from the mechanism

Which countries will be eligible for assistance from this mechanism? Historically, the “Group of 77” Countries are regarded as ‘developing countries.’ However, some of these countries have acquired the characteristics of developed countries (example, South Korea, Singapore, some Gulf countries, etc). Perhaps the eligible countries can be selected on the basis of per capita income or per capita GHG emissions (PCE) (as in Montreal Protocol). One possibility is to divide non-Annex 1 countries into 2 categories – those with PCE less than global average PCE and others. Different types of assistance can be considered for the two categories.

3.3 Activities eligible for Assistance and Need for Independent Technical Advice.

What activities will be assisted by the TTM? Technology transfer assistance should only finance activities that reduce greenhouse gas emissions to fulfill specific goals of countries. This means that only those countries that agree to specific short- and long-term voluntary goals (that can be reviewed periodically) would be assisted. These goals would

be part of a country programme that would be prepared by countries and approved by the TTM. The TTM has to ensure that all the activities of all the UN or bilateral agencies (and any other willing NGO) are coordinated to fulfilling the goals of the country programmes.

The TTM and the countries need constant advice on activities and technologies that will most reliably and efficiently deliver results. The UNFCCC does not currently have an advisory body at present to fulfill this role. The Subsidiary Body on Scientific, Technical, and Technological Advice (SUBSTA) consists of government delegates and cannot give high-level detailed technical advice. The advice from the Intergovernmental Panel on Climate Change (IPCC) is only once in 5 years. What UNFCCC needs is an independent body, modeled after the Technology and Economic Assessment Panel (TEAP) of the Montreal Protocol. The Panel of experts chosen by the Parties can be assisted by Technical Options Committees of experts for as many sectors as necessary. The Parties can prioritize large sectors such as steel, cement, fertilizers, aluminum, coal, power, renewables, energy efficiency, forestry, etc. The co-chairs of these committees can be appointed by the Parties, but the co-chairs can be given freedom to choose the most qualified members. They can consist of government, academic, and industry experts and can report every year on the latest developments in technologies. Like the TEAP, their reports will be placed as they are before the Parties without any change. The Parties and TTM can make use of these reports for finalizing the projects and activities.

3.4 What Costs Will Be Met by the TTM?

The TTM can adapt the successful incremental cost criteria from the Montreal Protocol Multilateral Fund. Montreal Protocol Parties have approved a written indicative list of incremental costs. These finally boiled down broadly to meeting (a) institutional strengthening in the developing countries, (b) networks, (c) preparation of country programmes, (d) awareness and training of decision makers, (e) establishment of appropriate regulations and policies, (f) licensing fees of alternative technologies, (g) incremental costs of the hardware, training, and trials on the alternative technologies, and (h) incremental operating costs. Notes on these reimbursable incremental costs as learnt from the Montreal Protocol and their appropriateness of the TTM are discussed below. It is essential that TTM specify a comparable written list to enable donors to provide predictable funding and for developing countries to plan their activities.

3.4.1 Institutional Strengthening.

A country focal point for climate change is essential to develop and implement country programmes in developing countries. The ‘climate cell’ in each developing country could assist the government to:

- coordinate the country activities for green growth;
- consult with industry and other interested organizations on the steps to be taken for the delineation of the growth path and implementation;

- prepare a country programme setting out a strategy and sectoral goals and a plan of action to achieve these goals;
- coordinate the technical and financial support of the implementing agencies, the bilateral agencies and the financial mechanism;
- organize awareness and training programmes for industry and the public; and
- create an effective national system for monitoring and reporting on national progress towards the goals the country set itself.

The Montreal Protocol Multilateral Fund (MPMLF) financed the costs of such focal points for all developing countries on an agreed scale.

3.4.2 Networks

Networks of such focal points would be very useful for spread of the best practices. Developed countries could join networks that would promote exchange of knowledge and experience, mutual assistance, and competitive spirit to achieve the goals. The MPMLF has set up nine such networks and these proved to be very helpful.

3.4.3 Preparation of Country Programmes

Country programmes are implementation road maps: they set short- and long-term goals based on a country-specific assessment of regulatory, institutional, technological, and financial capacity and consistent with each country's domestic policy priorities, including economic development. Setting specific voluntary goals tailored to individual countries or industry sectors is an essential ingredient for success. Replenishment of funds to the TTM is possible only if such goals are agreed to. The MPMLF financed the cost of preparing such programmes.

3.4.4 Awareness and Training of Decision Makers

The TTM could organise awareness, education and information, and training programmes in coordination with other global environmental agreements to take advantage of economies of scale and ensure quality control. The United Nations Environment Programme's (UNEP) Green Customs initiative is a useful model, as it involves several multilateral environmental agreements, including the Montreal Protocol, the Basel Convention, and the Convention on International Trade in Endangered Species.

3.4.5 Establishment of Appropriate Regulations and Policies

Laws and regulations can have a major impact on GHG emissions because they affect business behavior and public habits. Governments could induce technology change through regulation of energy markets, environmental regulations, energy efficiency standards, and energy and emission taxes. Many GHG reduction policies also help reduce air pollution, provide energy independence through less reliance on imported fossil fuels, improve the efficiency and operation of transportation systems, and protect biodiversity.

The policies aim, inter alia, to:

- encourage use of natural gas instead of coal or petroleum;
- improve the efficiency of energy production;
- promote non-fossil-fuel energy sources such as nuclear and hydroelectric power and renewable energy;
- improve end-use efficiency in buildings and industry and residential appliances; and
- improve the efficiency of automobiles, reducing transport demand, etc.

Some governments have cut GHG emissions with a mixture of carrots and sticks – with inducements, subsidies, voluntary programmes, regulations, and fines. Several have attacked the problem directly by imposing ‘taxes’ on carbon use. Others have established ‘carbon markets,’ where units of energy use may be bought and sold.

The MPMLF has assisted establishment of regulations and policies in countries.

3.4.6 Licensing Fees of Alternative Technologies

There are three categories of technologies:

- in public domain;
- owned by many companies willing to sell them at reasonable price and conditions;
- and owned by only a few companies, protected by intellectual property rights (IPR) and owners either unwilling to transfer their technologies at any cost or put a large cost and unreasonable conditions for transfer.

The Montreal Protocol (MP) experience is that all technologies needed to implement MP, except a few, are in the first two categories. In case of the second category, the MP’s MLF met the licensing cost of the technologies needed by developing countries and these proved to be a small part of the total cost. The third category is the most challenging. Some developing countries demand that the IPR should be waived in such cases. The same demand was made in MP in 1989, but the developed countries refused. Today, many enterprises in developing countries also own unique and globally valuable technologies in many applications, and these developing country enterprises and inventors also insist on IPR for their technologies. The MPMLF did not agree to unreasonable conditions, nor did they finance the technology transfer when the costs were huge. In a few years, more companies developed the same technologies, and the prices quickly came down. Also, the developing countries developed such technologies themselves.

3.4.7 Incremental Costs of Hardware and Incremental Operating Costs for an Agreed Period

This is a major cost. The MPMLF met these costs as the developing countries had time bound mandatory goals and the issue was one of changing the technology in the existing

factories. In case of climate change, the developing countries have no such mandatory targets.

3.4.8 Applicability of the MP MLF Experience on Incremental Costs to Climate Change.

The costs that will be met by the TTM have to be written down, and this is a matter of negotiation. It is the judgment of many technology transfer practitioners (that needs to be confirmed by a quick study) that the ‘software’ of technology transfer consisting of country focal points, networks, country programme preparation, training, establishment of the requisite regulations and policies, and licensing fees of alternative technologies, where these are considered reasonable, are affordable by donors and are crucial for promoting the technology transfer. Whether the donors will meet the whole or part of the incremental hardware and operating costs is a matter for negotiation. It has to be pointed out that there are many developing countries already taking measures for reasons in addition to climate change mitigation.

At the national level, the climate change mitigation measures will result in improved competitiveness, energy security, less reliance of oil imports whose prices are continuously increasing, job creation, and environmental protection. Consumer benefits from energy-efficient technologies can be grouped into the following categories: 1) improved indoor environment, comfort, health, safety, and productivity; 2) reduced noise; 3) labour and time savings; 4) improved process control; 5) increased reliability, amenity or convenience; 6) water savings and waste minimization; and 7) direct and indirect economic benefits from downsizing or elimination of equipment. Such benefits have been observed in all end-use sectors. For renewable and distributed energy technologies, the non-energy benefits stem primarily from reduced risk of business interruption during and after natural disasters, grid system failures or other adverse events in the electric power grid.

3.5 Administration of the TTM

The TTM has to be administered in such away as to inspire the confidence of all the Parties in its functioning. The TTM will take all the decisions, subject to the supervision of the COP, on the crucial issues of approval of country programmes and projects. The only way of administering it is to administer it democratically. The MPMLF is a good example. It is administered through an Executive Committee consisting of equal number of representatives of donors as well as recipients. The decisions are through a consensus or through a double majority of both the groups. It is assisted by a Secretariat.

The Bali COP/MOP decision on the adaptation fund is also a good model. The administration is through a Board with 16 members representing parties to the Protocol, with two representatives from each of the five UN regional groups, one from SIDS, one from the LDCs, two non-Annex I parties, and two Annex I parties. Decision making is to be by consensus, and, in the event of no agreement, by two-thirds majority. The decision

includes an invitation to the GEF to provide secretariat services to the Board on an interim basis, and an invitation to the World Bank to serve as a trustee on an interim basis.

It would be a good idea to combine the functions of this Board and the TTM Board under a single secretariat.

3.6 Need for Assured Periodical Replenishment of the TTM

The final costs of TTM to achieve country goals as agreed to by the TTM Board will not be known and can only be refined as the activities go along. So there is no use to fix the size of the fund now. The donors have to agree to fund the TTM periodically to meet its requirements till the agreed country goals are achieved. The contributions by the donors can be in the ratio of their UN scales of contribution.

The needs for the replenishment of the TTM have to be periodically determined by an independent study. In case of the MPMLF the Parties request the Technology and Economic Assessment Panel of the Protocol to study and recommend the replenishment once in three years. The Meetings of the Parties decide on the replenishment based on this study. The UNFCCC can rely on their technical committee modelled after TEAP for this purpose.