Climate Change and Requirement of Transfer of Environmentally Sound Technology

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(A thesis submitted for the partial fulfillment of the requirements for the degree of Master in Sustainable Development)

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Spring, 2011
ACKNOWLEDGEMENT

First of all I would like to thank my supervisor Dr. Charlotta Zetterberg for her abundant intellectual support and prolific suggestions. Her advice and important comments on the text helped me during research and writing of this thesis.

I am thankful to the UNFCCC website as the texts and materials of the UNFCCC official website was a mammoth source of information for this thesis.

I also want to thank my parents and siblings, whose love and guidance is with me in whatever I pursue.

On a different note, many people have been a portion of my graduate education in Uppsala and I am greatly grateful to all of them.
LIST OF ABBREVIATIONS AND ACRONYMS

CDM-Clean Development Mechanism
CER-Certified Emission Reduction
COP-Conference of the Parties
DC-Developing Countries
EC-European Community
EGTT-Expert Group on Technology Transfer
EIT - Economies in Transition
EST- Environmentally Sound Technology
FDI- Foreign Direct Investment
GEF- The Global Environment Facility
GHG- Green House Gas
IEA- International Energy Agency
IIASA- The International Institute for Applied Systems Analysis
IPCC-Intergovernmental Panel on Climate Change
ITT –International Technology Transfer
JI-Joint Implementation
LDC- Least Developed Countries
NEET-Network of Expertise
R&D-Research and Development
SBSTA-The Subsidiary Body for Scientific and Technological Advice
SBI-The Subsidiary Body for Implementation
TEAP-Technology and Economic Assessment Panel
Clear- Technology Transfer Clearing House
UN- United Nations
UNEP- United Nations Environment Programme
UNFCCC - United Nations Framework Convention on Climate Change
WMO - World Meteorological Organization
WTO- World Trade Organization
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ABSTRACT

Technology and policy play a twofold role in international environmental laws. Stronger environmental policies encourage new green technologies and likewise, better technologies make it easier to regulate. “Technology transfer” refers to the transfer from one party, an association or institution that developed the technology, to another that adopts, adapts, and uses it. As different kinds of threats posed by climate change are continuously increasing all over the world the issue of “technology transfer” especially the transfer of environmentally sound technologies has become one of the key topics of international environmental debates.

This thesis addresses, firstly, the possible methods of technology transfer and secondly, how current international environmental laws play its role to facilitate the transfer. Accordingly, I have focused on the concerned provisions of Kyoto Protocol and its subsequent implementation measures. I have also taken in to account the decisions of the annual meetings of the Conference of the parties (COPs) of the UNFCCC.

The thesis has also made a brief comparative discussion between the provisions of international environmental laws and the provisions of intellectual property rights in terms of technology transfer.

However, at the last stage of the thesis, some potential recommendations are mentioned and briefly discussed in view to come up with a sustainable solution.

In addition to the international environmental law, I have also tried to figure out some other international or multinational instruments which concern the transfer of environmentally sound technologies.
1. INTRODUCTION

1.1 Background

Generally “technology transfer” only means going technology, either as idea or as equipment from one area to another. However, the formal definition of the concept is given by the Intergovernmental Panel on Climate Change (IPCC),¹ technology transfer is: the broad set of processes covering the exchange of knowledge, money and goods amongst different stakeholders that leads to the spreading of technology for adapting to or mitigating climate change.²

The concept of “technology transfer” can be divided into two parts:

i. Transfer of patented technology, which are also known as “hard” technology

ii. Transfer of undefended technology, which are also known as “soft” technology e.g. Know-how.³

The issue is so complex when it comes to the global context, where several parties and stakeholders are involved.⁴ However, this definition encompasses the entirety of technology transfer and in the context of the transfer of environmentally sound technology, it is important to define what actually an environmentally sound technology is. Agenda 21⁵ of the UN provides that environmentally sound technologies (ESTs):

- protect the environment,
- are less polluting,
- use all resources in a more sustainable manner,
- recycle more of their wastes and products, and

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¹The Intergovernmental Panel on Climate Change (IPCC) is an intergovernmental body comprised with scientific experts tasked with research concerning the climate change issues. See more under “Transfer of ESTs under International Environmental Law” of the dissertation.


³See Cameron J. Hutchison, Does TRIPS Facilitate or Impede Climate Change Technology Transfer into Developing Countries? 3 U. OTTAWA L. & TECH. J. 520 (2006).

⁴Id.

⁵UN Department of Economic and Social Affairs, Division for Sustainable Development, Documents, archived at http://www.webcitation.org/5at3iTeT3. Agenda 21 was adopted at the UN Conference on Environment and Development held in Rio de Janeiro in 1992).
handle residual wastes in a more acceptable manner than the technologies for which they were substitutes.6 Besides, chapter 34 of Agenda 21 also includes that, ESTs in the context of pollution are "process and product technologies" that produce low or no waste, for the preclusion of pollution. They also include "end of the pipe" technologies for management of pollution after it has been produced.7 Moreover, “ESTs are not just individual technologies, but total systems which include know-how, procedures, goods and services, and equipment as well as organizational and managerial procedures.”8 Thus, at the time of discussion on transfer of ESTs, some other issues, such as the human resource development and local capacity-building aspects of the choice of technology, and gender-relevant aspects etc. should also be addressed. Moreover, ESTs should be well-matched with national policy of socio-economic, cultural and environmental priorities.9 Using this definition of ESTs helps clarify exactly what an environmentally sound technology is, and has latter implication for a technology transfer treaty. The thought of technology transfer was first referred in the Principle 9 of the Rio Declaration of 1992 and accordingly Agenda 21 devotes its chapter 34 to the transfer of ESTs.10 Moreover, the United Nations Framework Convention on Climate Change (hereinafter UNFCCC)11 provides mandate to the developed nations to facilitate transfer of technology to the rest of the parties.12 Thus the issue has continued to receive attention at every meeting of the Conference of the Parties13 (hereinafter COP) and it played a vital role during discussions between the member states at COP 15 of Copenhagen and COP 16 of Cancun.14

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6 See Agenda 21, Chapter 34, Transfer of Environmentally Sound Technology, Cooperation and Capacity-Building, 34.1 archived at http://www.webcitation.org/5at3jiGC2.(last visited on 26 Nov, 2010).
7 See Chapter 34.2 of Agenda 21.
8 See Chapter 34.3 of Agenda 21.
10 See United Nations Department of Economic and Social Affairs Division for Sustainable Development, Agenda 21, ch. 34, (June 14, 1992).
11 The United Nations Framework Convention on Climate Change (UNFCCC or FCCC) is the international environmental treaty, which produced at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992. It is popularly known as the Earth Summit.
13 The member states of the UNFCCC have been meeting annually in Conferences of the Parties (COP) to assess progress in dealing with climate change. See more under “Transfer of ESTs under International Environmental Law” of the dissertation.
As the question of facilitation of transfer of environmentally sound technologies needs priority attention in order to fight against catastrophic challenges posed by “climate change”, it is the time to examine the role of the international environmental law for transferring the environmentally sound technologies.

1.2 Purpose of the Dissertation

The key goal of this dissertation is to examine the role of international environmental laws to ensure the transfer of Environmentally Sound Technologies (ESTs), mainly from the developed world to the developing world. The guiding research question of the dissertation is: *To what extent are the existing mechanisms of international environmental laws sufficient to ensure and promote the transfer of ESTs?*

The main attention in the dissertation has been paid to the transfer of environmentally sound technologies from the developed world to the developing world, as “technology transfer” is considered as an important means of achieving sustainable development of the world. However, at the final stage, based on the facts and figures, the dissertation has also been aimed to come up with some potential recommendations.

1.3 Scope and delimitation

The dissertation only examines the present legal frameworks applied to the “technology transfer” i.e. transfer of the environmentally sound technologies. The dissertation mainly covers international environmental laws concerning technology transfer. But, implication of intellectual property rights over technology transfer has also been popped up very briefly. The dissertation is also limited with the discussions of the environmental instruments, which are international in nature; no bilateral agreements or national legislations have been discussed.

However, the dissertation discusses the various methods of global “technology transfer” to compare the efficiency of the methods to ensure the transfer.

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15 Sustainable Development refers to the development that “meets the needs of the present without compromising the ability of future generations to meet their own needs”, see more on :“Report of the World Commission on Environment and Development.”, United Nations. 1987 and General Assembly Resolution 42/187, 11 December 1987.
The comparative law analysis is very brief and limited between the legal frameworks under the United Nations Framework Convention on Climate Change (UNFCCC) and Agreement on Trade Related Aspects of Intellectual Property Rights (hereinafter TRIPS). In fact, within the scope of the dissertation it was also not possible to compare two entire frameworks, which was also not the main attention of the dissertation.

2. METHODS OF TECHNOLOGY TRANSFER

Denis Simon in his essay “International Business and the Trans border Movement of Technology” says about three classes of technology transfer:

i. Material transfer: Physical goods ranging from product parts to fully operational plants.

ii. Design transfer: Blueprints or other types of information applied to assemble products or production facilities.

iii. Capacity transfer: Education and instruction not only to activate existing plants but also to expand innovations in products and processes.\(^{16}\)

As, taken as a whole, in addition to the material or physical transfer technology transfer is the stream of information from one human being to another through scientific literature, direct human contact or education, many variables decide which trail environmentally sound technologies take from a supplying nation to the receiving nation. In general, the following four methods can be treated as pathways for technology transfer\(^{17}\):

i. Foreign Direct Investment (FDI)

ii. Public Knowledge

iii. Licensing

iv. International Trade

2.1 Foreign Direct Investment (FDI)


Foreign Direct Investment (FDI) refers to any type of investment that earns interest in enterprises functioning outside of the home territory of the investor. FDIs involve a business connection between a parent company and its foreign subsidiary. However, an investment can be regarded as an FDI, if the parent firm has at least 10% of the ordinary shares of its foreign affiliates. Besides, an investing firm may also be treated as FDI if it has voting power in a business project working in a foreign country.\(^\text{18}\) FDI is different from indirect investment which is defined as investing in a portfolio or further non-physical investments.\(^\text{19}\) For an instance, in between 1990 to 2000, above $680 billion of investments went to the developing countries for infrastructure projects as FDI from USA. The amount rose to 947 billion dollars in 2007.\(^\text{20}\) Among all countries China (received 90 billion dollars in 2007) is the most popular target for FDI.\(^\text{21}\) However, the stream of investment in green technologies\(^\text{22}\) from developed nations to developing nations results in the transfer of ESTs\(^\text{23}\), because the knowledge based asset of the corporations grants a cost or quality benefit if it is produced in several location.\(^\text{24}\) Besides, when a country imports higher class intermediary goods to use in manufacture processes, technology disseminates automatically.

Since the foreign investors frequently bring with their asset-efficient corporate governance, which are not necessarily seen in licensing or international trade, technology can unreservedly stream to the receiver firm through FDI.\(^\text{25}\) Such kind of enlarged technological basis is important


\(^{19}\)Id.


\(^{21}\)Id.

\(^{22}\)Environmentally Sound Technologies are also referred as “Green Technologies”


\(^{24}\)See Keith Maskus, Encouraging International Technology Transfer, 10 (May 2004), available at http://www.iprsonline.org/unctaditstd/docs/CS_Maskus.pdf (last visited on December 18, 2010).

because it can spillover into the local economy. Thus, FDI is a very effective method to disseminate ESTs needed to combat climate change.

2.2 Public Knowledge

Access to a basic supply of foundational knowledge can build combined blocks, which ultimately make scientific commons. Thus, Technology placed into the public domain is another mean of disseminating ESTs from the developed nations to the developing nations and such kind of technology transfer is evidenced by the Budapest Open Access Initiative. Around 5187 signatures including the American Association of Law Libraries, and the Association of College and Research Libraries have currently authorized the scheme.

The speech of Uganda’s environment minister Maria Mutagamba- “We know the challenges are there, but we cannot respond to the challenges because we don't have the capacity,” and the country is "on the receiving end of technology that we cannot understand” makes obvious the need for further research and technology to enter into public knowledge.

2.3 Licensing

Where FDI is not possible due to technical trade barriers or for some other practical reasons, licensing exists there allowing the receiving state to buy a segment of manufacture or distribution right and at the same time the knowledge essential to be able to utilize that purchased right. Another way of transfer of ESTs can be providing license of a patented process or a green technology. Through “licensing” technology transfer happens via “spillover”, which also occurs in case of FDI.

26 Spill over of information happens when the competing companies learn without any formal benefit going to the owner company of the technology. Three popular ways of Spillover are: i. transfer of skilled personnel between firms ii. Reverse engineering of products or process and iii. Finding information through patent application.


2.4 International Trade

As the international trade provides the domestic companies opportunity to avail advanced technology (e.g. technological information, capital goods) from foreign sources, it ultimately results into technology transfer.\textsuperscript{32} The potential of opportunity for technological spillover under the international trade can easily be proved by the statistics that, in a month of 2008, the USA exported goods and services of 151.4 billion dollars and imported that of 213.7 billion dollars.\textsuperscript{33}

3. BRIEF REVIEW OF TEXT ON TRANSFER OF ESTs

The Fourth Assessment Report of the United Nations Intergovernmental Panel on Climate Change (IPCC) (AR4) notes that, now it is clear to all that the technology will play the major role in meeting climate change targets and aspirations.\textsuperscript{34} Bruckner et. el (2007) abridges the issue of ESTs as, “…new innovative technology cooperation mechanisms will be required to both deploy existing technologies in emerging economies and develop and share new low carbon technologies…Such a response to the dangers of global climate change would induce a transition towards a truly sustainable global energy system as a glorious ‘side effect’.”\textsuperscript{35}

The International Institute for Applied Systems Analysis (IIASA) report of 2007 considers technology in a broader economic context: “Technology is the main driving force of productivity and economic growth. Historical studies attribute about half of economic growth to technological

\textsuperscript{34} See \textit{Climate Change 2007}, the Fourth Assessment Report (AR4) of the United Nations Intergovernmental Panel on Climate Change (IPCC), is the fourth series of reports concerning issues of climate change.
change and the other half to the combined effect of all other driving forces.”

Sir Stern has also given importance to the role of technology as he defines success as, “a competitive supply of low carbon technologies, declining rapidly in cost over time, resulting in the substitution away from higher-carbon alternatives in both production and consumption.”

4. TRANSFER OF ESTs UNDER INTERNATIONAL ENVIRONMENTAL LAW

4.1 The Intergovernmental Panel on Climate Change (IPCC)

The Intergovernmental Panel on Climate Change (IPCC) was established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) in view to evaluate accessible information on the science, impacts, and economics of climate change and at the same time to prepare adaptation and mitigation options. The IPCC has published several reports and technical papers, which are considered as benchmark works of reference for legislators, policymakers, and relevant scientists. Among all of its report, the Fourth Assessment Report of IPCC, which was published on February 2, 2007, is noteworthy. It states “with very high confidence” that “the global average net effect of human activities since 1750 has been one of warming.”

As this report is made by more than 600 authors, and evaluated by delegates from 113 countries, it is treated as the consensus on the anthropogenic authority on global climate change. The report cites increased global average air and ocean temperatures,

39 Id. at V, see also IPCC Reports, 2007 available at http://www.webcitation.org/5at2PGdYr. (last visited on Nov. 25, 2010).
extensive melting of glaciers and snow cover, and rising global average sea level as evidence of an “unequivocal” warming of the climate system.\textsuperscript{41}

The report depicts some recent features of environment e.g. augmented global average atmosphere and oceanic temperatures, wide-ranging melting of glaciers and snow cover, increasing global regular sea level etc. as clear proof of warming of the climate system. The report blames increasing GHG concentrations resulting from human activity as key reason behind the fact.\textsuperscript{42} The IPCC also provides scientific and methodological suggestion to the Conference of the Parties (“COP”) to the UNFCCC and its supplementary bodies.\textsuperscript{43}

At present IPCC is preparing its Fifth Assessment Report (AR5) which will be reported in 2014. The framework of the AR5 is sketched to be prepared through a scoping process. The process engages experts of climate change from all concerned disciplines and at the same time the users of IPCC reports, specifically representatives from governments.\textsuperscript{44}

Although the IPCC does not continue its individual original research, it publishes special reports on topics pertinent to the implementation of the UN Framework Convention on Climate Change (UNFCCC) and its subsequent protocols. The main bases of IPCC report are peer reviewed and published technical and scientific literature.

However, though The IPCC is only open to member states of the World Meteorological Organization (WMO) and United Nations Environment Programme (UNEP), the reports of IPCC are almost extensively cited in more or less every dispute linked with climate change.\textsuperscript{45}

\section*{4.2 The UNFCCC: The United Nations Framework Convention on Climate Change}

The UNFCCC was concluded at the 1992 Rio Earth Summit to attain the stabilization of GHG concentrations in the environment at enough low level to avert hazardous anthropogenic

\textsuperscript{41} Id. at 5.
\textsuperscript{42} Id. at 10.
\textsuperscript{43} See IPCC REPORT; supra note 42, at vii. See also UNFCCC, Report of the Subsidiary Body for Scientific and Technological Advice on its twenty-sixth session, held at Bonn from 7 to 18 May 2007.
\textsuperscript{44}See http://www.ipcc.ch/ (last visited on Nov. 25, 2010).
intrusion with the climate system.\textsuperscript{46} From the beginning of the adoption of UNFCCC, transfer of ESTs was expected to take a noteworthy role in achieving its objective. However, the UNFCCC distinguishes the member states into three categories and fixes different commitments for them:

**i. Annex I Parties:** Industrialized countries (members of the OECD)\textsuperscript{47} and countries which economies were in transition (EITs, e.g., the Baltic States) in 1992 are categorized as Annex I parties. These countries are expected to “adopt climate change policies and measures with the aim of reducing their greenhouse gas emissions”\textsuperscript{48} provided that the EIT states are allowed to enjoy some flexibilities on their commitments.

The number of the member states of Annex I countries is 40, where the European Union is also a member of the parties.

**ii. Annex II Parties:** Annex II countries are a sub-group of the Annex I countries comprised with the only OECD members, excluding those that were economies in transition in 1992. So, mere industrialized countries (OECD countries from the list of Annex I countries) are categorized as Annex II parties. These countries are required to “provide financial resources to enable developing countries to undertake emissions reduction activities under the Convention and help them adapt to the adverse effects of climate change”. Moreover, UNFCCC requires the Annex II parties to take “practical steps” for the development and transfer of ESTs to EIT (Economies in transition) and developing country (DCs) parties.\textsuperscript{49}

The European Union and 23 developed countries are categorized as Annex II countries. Though Turkey was a party of Annex II countries it requested to distinguish its economy as a transition economy in 2001.


\textsuperscript{47} The Organisation for Economic Co-operation and Development (OECD) is an international economic organisation. It is made up of 34 countries and was founded in 1961 in view to stimulate economic progress and world trade.


\textsuperscript{49} \textit{Id.}
iii. Non-Annex I Parties: Developing and least developed countries (LDCs) parties of the convention are categorized as Non-Annex I Parties. According to the article 4.1 of the convention the parties have “inventorying, reporting and cooperation” obligations basing on the principle of “common but differentiated responsibilities.” Article 4.7 is framed to promote the capability of developing country parties to accomplish their commitments under the UNFCCC to the effectual implementation by developed country parties of their commitments concerning financial aid and transfer of ESTs.

So, the success of the compliance with the commitments of the developing country parties of UNFCCC really depend on the sincere implementation of the developed country parties’ commitments related to the financial resources and transfer of technology. Besides, the key provision concerning transfer of technologies from Annex II to developing countries is laid down in Article 4.5, as follows:

The developed country Parties and other Parties included in Annex II shall take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies and know-how to other Parties, particularly developing country Parties, to enable them to implement the provisions of the Convention. In this process, the developed country Parties shall support the development and enhancement of endogenous capacities and technologies of developing country Parties. Other Parties and organizations in a position to do so may also assist in facilitating the transfer of such technologies.

However, provisions concerning dissemination of technologies amongst all Parties are mentioned in Article 4.1 of UNFCCC:

All Parties, taking into account their “common but differentiated responsibilities” and their specific national and regional development priorities, objectives and circumstances, shall:

[...]

(c) Promote and cooperate in the development, application and diffusion, including transfer, of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol in all relevant sectors, including the energy, transport, industry, agriculture, forestry and waste management sectors; [...]

50 See United Nations Framework Convention on Climate Change 1992, archived at http://unfccc.int/resource/docs/convkp/conveng.pdf (last visited on November 31, 2010), See Art. 4.1
51 Id. Art. 4.7
52 Id. Art. 4.5
(h) Promote and cooperate in the full, open and prompt exchange of relevant scientific, technological, technical, socioeconomic and legal information related to the climate system and climate change, and to the economic and social consequences of various response strategies; [...] 53

Finally, Article 4.3 addresses the financing of technologies:

The developed country Parties and other developed Parties included in Annex II shall provide new and additional financial resources to meet the agreed full costs incurred by developing country Parties in complying with their obligations under Article 12, paragraph 1. They shall also provide such financial resources, including for the transfer of technology, needed by the developing countries . . . 54

In addition to the above mentioned provisions, articles 4.3, 4.7, 4.8, 4.9, 9.2, 11.1, 11.5, 12.3 and 12.4 of UNFCCC also have implications to the transfer of ESTs and since then the transfer of ESTs from developed to the developing countries has been central to international initiatives to trim down GHG emissions. 

As the member states of UNFCCC acknowledges that countries fluctuate in their capacities to achieve the goals of the convention, they instituted quite a few methods including financing and technology transfer through which countries could cooperate to meet these goals. 55 It consequently adopted Kyoto Protocol; but the convention did not set any binding GHG emission targets. 56

4.2.1 The UNFCCC Structure for Negotiating and Discussing Technology Transfer

The highest body of the convention is The Conference of the Parties (COP) 57 , which meets annually to “review the implementation of the convention, adopt decisions to further develop the convention’s rules, and negotiate new commitments.” 58 The COP is supported by two subsidiary bodies:

i. The Subsidiary Body for Scientific and Technological Advice (SBSTA):

53 Id. Art. 4.1
54 Id. Art. 4.3
55 Id, Arts. 4.1(c), 4.3, 4.5.
57 See Uniting on Climate: A Guide to the Climate Change Convention and the Kyoto Protocol, Supra note 52 at 16.
58 Id.
This subsidiary body supports the effort of the COP concerning “matters of science, technology, and methodology, including guidelines for improving standards of national communications and emission inventories”\textsuperscript{59} It also monitors the works of the Expert Group on Technology Transfer (EGTT).

ii. **The Subsidiary Body for Implementation (SBI):**

This subsidiary body supports the COP in the assessment and review of the implementation issues. It analyses national communications presented by the member states and at the same time it deals with monetary and administrative matters\textsuperscript{60} This body is also responsible to monitor the Expert Group on Technology Transfer (EGTT).

However, in addition to the above mentioned subsidiary bodies the following bodies, which are independent from UNFCCC, also assist the COP:

**Intergovernmental Panel on Climate Change (IPCC):** IPCC assists COP through providing information via reports at the demand or request of the COP or the SBSTA.

**The Global Environment Facility (GEF):** GEF is liable to operate the general financing mechanism of the Convention. Its function includes directing grant or loan funds to developing countries.

**4.2.1.1 Expert Group on Technology Transfer (EGTT)**

Expert Group on Technology Transfer (EGTT) is the main UNFCCC body for technology transfer and it was established with “the objective of enhancing the implementation of Article 4, paragraph 5, of the convention, including, *inter alia*, by analyzing and identifying ways to facilitating and advance technology transfer activities and, making recommendations to the Subsidiary Body on Scientific and Technological Advice.”\textsuperscript{61}

**4.3 The Kyoto Protocol**

\textsuperscript{59} *Id.*

\textsuperscript{60} See *Uniting on Climate: A Guide to the Climate Change Convention and the Kyoto Protocol*, Supra Note 52 at 15.

The Kyoto Protocol, adopted in Kyoto, Japan in 1997 is the first protocol to the UNFCCC\textsuperscript{62} and till now the protocol has been ratified by 193 (192 States and 1 regional economic integration organization) parties.\textsuperscript{63} This international legal instrument has set strict and lawfully binding targets of emission reduction for the known GHGs e.g. Carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), sulfur dioxide (SO2), sulfur hexafluoride (SF6), hydro fluorocarbons (“HFCs”), and per fluorocarbons (“PFCs”).\textsuperscript{64}

In Art. 3, Kyoto Protocol refers COP to the transfer of technology as it lays down “…the Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session, consider what actions are necessary to minimize the adverse effects of climate change and/or the impacts of response measures on Parties referred to in those paragraphs. Among the issues to be considered shall be the establishment of funding, insurance and transfer of technology.”

Although the protocol binds the developed countries to explicit emission reduction targets, similar obligation are not found for developing countries.\textsuperscript{65} The group object for the thirty-seven industrial countries and the European Community is a reduction in emissions to an average of five percent below the 1990 level over the period 2008 - 2012.\textsuperscript{66} However, the Kyoto Protocol explicitly addresses the transfer of ESTs in Article 10(c), which necessitates all Parties to: “Cooperate in the promotion of effective modalities for the development, application and diffusion of, and take all possible steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies…”

Besides, Kyoto Protocol directly or indirectly concerns the issue- transfer of technology through its three flexible mechanisms:

- Emission Trading
- Joint Implementation (JI)

\textsuperscript{63} UNFCCC, Kyoto Protocol Status of Ratification is available at http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php (last visited on Nov. 25, 2010).
\textsuperscript{64} Kyoto Protocol, supra note 66, Annex A.
\textsuperscript{65} See Kyoto Protocol, supra note 66, Art. 3 and Annex B., archived at http://unfccc.int/resource/docs/convkp/kpeng.pdf (last visited on December 7, 2010).
\textsuperscript{66} See Kyoto Facts; supra note 66, at 1.
Clean Development Mechanism (CDM)

4.3.1 Emission Trading

The mechanism “emissions trading” means that, Annex I countries may attain emissions reductions target by trading greenhouse gas emission permits with other members of Annex I and countries who fall short to achieve their targets are allowed to buy permits from those countries that have overachieved their targets. As this mechanism takes place between the member states of the Annex I parties, it does not concern the transfer of ESTs to the developing and least developed countries.

4.3.2 Joint Implementation (JI)

The mechanism Joint Implementation means, Annex I country can invest in emission reduction projects in any other Annex I country as a substitute to reducing emissions domestically. Through Joint Implementation, countries can lower the costs of conformation with their Kyoto targets by investing in GHG gas reductions in an Annex I state where reduction costs are cheaper, and subsequently applying the obtained credit to fulfill their commitment goal.

For instance, a JI project may surrogate a coal-fired power plant with a more competent combined heat and power plant. However, as JI projects are anticipated to establish in the countries known as "economies in transition," according to Annex B of the Kyoto Protocol, it is found that, Russia and Ukraine are currently hosting most of the JI projects of the world. JI was considered by developing countries as “difficult to measure”, which supply very few benefits to developing countries.

4.3.3. Clean Development Mechanism (CDM)

67 See Kyoto Protocol, supra note 66, Art. 17 and visit also http://unfccc.int/kyoto_protocol/mechanisms/emissions_trading/items/2731.php (last visited on December 7, 2010).
68 See Kyoto Protocol, supra note 66, Art. 6, See more on UNFCC website: http://unfccc.int/kyoto_protocol/mechanisms/joint_implementation/items/1674.php (last visited on December 27, 2010).
69 Annex B of the Kyoto Protocol identifies 12 countries whose economies are in transition: Bulgaria, Croatia, the Czech-Republic, Estonia, Hungary, Latvia, Lithuania, Poland, the Russian Federation, Slovakia, Slovenia, and Ukraine.
70 See full list of JI projects at http://www.cdmpipeline.org/ji-projects. Htm #1 (last visited on November 29, 2010)
As per the Article 12 of the Kyoto Protocol, the Clean Development Mechanism (CDM) allows the developed countries for emission reductions in projects carried out in developing countries. CDM is intended to inspire sustainable development in host countries through permitting the developed countries to meet their reduction obligations in a foreign country in a lucrative manner. Such kind of projects can get saleable certified emission reduction (CER) credits, each comparable to one tonne of CO2, which can be calculated towards meeting Kyoto targets. As first international environmental investment and credit scheme providing a uniform emissions balance tool, CERs is considered by many as a pioneer mechanism. A CDM project action may include, for instance, a rural electrification project using solar panels or the fixing of extra energy-efficient boilers.

The intention of the creation of the Clean Development Mechanism at Kyoto is to address the problems of developing countries through providing a tool of flexibility aiming to provide sustainable development in non–Annex I (usually developing and least developed) countries. The concerned text of the Kyoto Protocol has laid down the aim of the CDM as: “to assist Parties not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the [Climate Change] Convention, and to assist Parties included in Annex I in achieving compliance with their [emissions reduction targets].”

### 4.3.3.1 Operating details of the CDM

A CDM project requires providing emission reductions, which are supplementary to what would otherwise have occurred and it must be eligible through a public registration and issuance procedure. However, the approval of CDM is required to be done by the Designated National Authorities and the system is supervised by the CDM Executive Board. This Board is eventually accountable to the Protocol ratifying countries.

Since 2006, the system has registered more than 1,650 projects. However, the system is expected to make CERs amounting to more than 2.9 billion tonnes of CO2 corresponding in

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72 See Kyoto Facts; supra note 60, at 1.
73 See Kyoto Protocol, supra note 66, Art. 12.3.
74 Id. Art. 12.
2008-2012, the first obligation period of the Kyoto Protocol.\textsuperscript{75} Statistics shows that, around 2099 CDM projects have been registered by the CDM Executive Board by 23 March, 2010 and around 4,000 projects are yet to be certified. However, the registered projects decrease GHG emissions by an estimated 220 million ton CO\textsubscript{2} equivalent per year.\textsuperscript{76}

The thought of ensuring transfer of ESTs has been an underlying idea expressed in the texts concerning international climate change text and it has led the signatories of the UNFCCC to create mechanisms to prop up technology transfer.

\textbf{4.3.3.2 Does CDM create real emission reductions?}

To evaluate the usefulness of CDM in reducing emissions it should be proved that CDM projects have achieved reductions that could not have happened without the project taking place. Article 12.5 of the Kyoto Protocol stipulates that, CDM projects should have the following three criteria:

1. There should have voluntary participation and approval by each involved party.
2. The project must bring “real, measurable, and long-term benefits related to the mitigation of climate change.” (“Prospect of long term benefit” criterion)
3. Reductions should be “additional to any that would occur in the absence of the certified project activity.” (“additionality” criterion)

Although last two criteria are inherently related – the criterion of “additionality” has obtained much more discussions than the criterion of “prospect of long term benefit”.\textsuperscript{77}

When a project is applied to be registered by the CDM Executive Board, the applicant is required to prove the requirement of “additionality” on the basis of current costs and benefits of the emission reductions. However, The UNFCCC has laid down some practical outline to assess the

\textsuperscript{75} See http://unfccc.int/kyoto_protocol/mechanisms/clean_development_mechanism/items/2718.php (last visited in November 18,2010)
\textsuperscript{76} See http://www.iges.or.jp/en/cdm/report_cdm.html
additionality requirement of anticipated CDM projects among those the basic four methodological steps are as follows:

i. **Discovering substitute options:** Is there any other option accessible to project participants? Do the alternative/alternatives conform to domestic laws and regulations?

ii. **Barrier study:** Is there any obstruction to implement any available alternative Project? If any obstruction is found then the alternatives are considered as “not-viable” alternatives. However, it is also examined whether any obstruction exists to implement the proposed CDM project.

iii. **Investment study:** It is also investigated whether the baseline circumstances can be a better monetary investment than the proposed CDM project.

iv. **Common practice analysis:** Is the anticipated project presently regular practice in the region? If it is regular or common practice then the emissions reductions are not considered as “additional”.

### 4.3.3.3 Encouraging Transfer of ESTs within CDM

As the language concerning CDM in the Kyoto Protocol does not explicitly refer to technology transfer, individual host countries are free to take measure to promote transfer of technology. At the time of the approval of the CDM projects by the governments of the host country, it is the responsibility of the concerned government to approve those CDM projects, which in consequence shall ensure the transfer of environmentally sound technologies.

For instance, CDM projects approval guideline of China states that “CDM project activities should promote the transfer of environmentally sound technology to China”

Although this guideline is not mandatory, it is found that around 75 percent of CDM emissions reductions in China are result of those projects that confirm the transfer of environmentally sound technologies.

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78 See UNFCCC, “Revision to the methodological tool ‘Combined tool to identify the baseline scenario and demonstrate additionality’, http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-02-v2.pdf , (last visited on December 19, 2010).

South Korea is one step ahead on this issue as it necessitates that “environmentally sound technologies and know-how shall be transferred” by the projects of CDM in Korea. Accordingly 88 percent of the reductions of emissions from CDM projects in South Korea are derived from those projects, which ensure the transfer of environmentally sound technologies. On the other hand, in the countries (e.g. Brazil, India) which do not consider the requirement of technology transfer at the time of approving CDM projects, the percentage of emission reductions resultant from the projects ensuring technology transfer is very low.

To examine the impact of CDM policy over transfer of technology, 644 CDM projects registered by the Executive Board of the UNFCCC was deeply observed. The objective of the observation was to determine the number of projects that transferred “hardware” i.e. equipment or machinery as opposed to “software” i.e. knowledge, skills, or know-how. The study found that 279 projects (43 percent of the projects), involve technology transfer and these projects are amongst the most noteworthy CDM projects, which are account for 84% of the estimated emissions reductions from registered CDM projects. Among the 279 projects, 57 projects transferred only equipment, 101 projects transferred mere knowledge, and 121 projects transferred both equipment and knowledge. The study observed that, the percentage of projects connecting technology transfer varied depending on the kind of technology used in the projects. Thus better understanding of the rates of diffusion and designing CDM projects focusing the spillover of knowledge are recommended for future CDM projects to ensure the transfer of ESTs.

4.4 The UNFCCC Clearing House

In order to comply with Article 4.5 of the UNFCCC, an online clearing house of technological data has been created by the United Nations. The clearing house is freely accessible on the Internet and it “provides up-to-date information about technology transfer; allows direct access

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to databases, publications, and case studies and promotes an exchange of views on different
technology transfer issues.” 83

To confirm the usability and efficiency of the clearing house a survey was sent to the parties, 84
and the outcome of the survey were awfully encouraging as 85 percent of respondents have
found the website helpful and important. Moreover, a fascinating bunch of follow up questions
to the survey has decorated a number of barriers to technology transfer such as: linking financial
aid to the technology, including training sessions on how to exercise the clearing house and on
how to successfully employ the technology, or having a translation service available to users of
the system. These issues can be addressed to make the clearing house more effectual. 85

However, although the survey discovered some barriers, the clearing house is still proved as a
booming mechanism to fulfill its function to facilitate transfer of ESTs.

5. INTERNATIONAL CENTRES CONCERNING ESTs OTHER THAN UNFCCC

5.1 International Center for Environmental Technology Transfer (ICETT)

Japan has complied with its commitments to the UNFCCC through The International Center for
Environmental Technology Transfer (ICETT), which represents the collective efforts of industry,
government, and academic world in Japan. 86

To promote the stream of scientific technological
information tied with the required skills to use that knowledge, the ICETT carries out various
kinds of activities 87 e.g. training, research and development, transfer of information, and
awareness building activities. 88 While the official website of the ICETT is vital segments of the
dissemination of ESTs, their other activities like technological conferences also help disseminate
ESTs.

83 See UNFCCC Adaptation, Technology and Science Technology Subprogramme, archived at http://ttclear.unfccc.int/ ttclear /jsp/ (last visited on Nov. 16, 2010) (discussing the results of the survey on the effectiveness of the use of the UNFCCC technology information clearing house (TT:CLEAR)
84 Id.
85 Id.
87 Id.
88 Id.
5.2 International Energy Agency (IEA) Implementing Agreements

To uphold harmonized strategy encircling the “three Es”: energy security, economic development, and environmental protection the International Energy Agency (IEA) was originated at the time of the oil crisis of 1973 to 1974. At present it acts as a policy consultant for its member countries. However, in order to achieve the above mentioned “three Es” the IEA has formed a chain of implementing agreements allowing scientists to involve with shared research and development. Implementing agreements of IEA are a process of transferring technology and these can also be applied as an outline for a technology transfer treaty. However, Network of Expertise in Energy Technology (NEET) of IEA is engaged to take the existing implementing agreements and widen their capacity by facilitating participation from more countries.

6. ESTs IN THE UNFCCC CLIMATE CONFERENCES

Since the ratification of UNFCCC, the issue of Transfer of ESTs has become a noteworthy agenda of almost every Conference of the Parties (COP). Some decisions facilitating the implementation of ESTs concerning articles of the convention has also been taken at COP. Till now there are 16 Conference of the Parties have been held and the key issues concerning transfer of ESTs discussed under the conferences are given below:

COP 1:
In 1995, the first Conference of Parties (COP1) of the UNFCCC was held in Berlin. COP1 adopted Decision 13/CP1, which concerns “Transfer of Technology”. Decision 13/CP1 calls for the Convention secretariat to organize an itemized advancement report on actual actions taken by the Annex II parties of the Convention, regarding their commitments on the transfer of ESTs and know-how. The decision actually reminds supporting and encouraging the growth of

91 See Decision 13/CP1 of COP 1.
endogenous capacities and proper technology in developing countries pertinent with the objectives of the Convention.

COP 2:
The second Conference of Parties was held in Geneva in 1996. COP 2 also adopted a particular decision on the transfer of ESTs. Decision 7/CP.2, i.e. “Development and transfer of technologies” of COP 2 recommends the Annex II Parties to accelerate their efforts in the transfer of technology in accomplishment of their commitments under Article 4.5. COP 2 also urges the Parties, mainly Annex II Parties- “to improve the enabling environment, including the removal of barriers and the establishment of incentives, for private sector activities that advance the transfer of technologies to address climate change and its adverse impacts.”

COP 3:
In 1997 COP 3 was held in Kyoto, where Decision 9/CP.3 i.e. “Development and transfer of technologies”, advises Parties to build an “enabling environment” to assist further motivate private segment investment in, and transfer of ESTs. It is noteworthy that, “Kyoto Protocol” has been concluded at COP 3.

COP 4:
COP 4 was held in Buenos Aires in 1998, and by decision 4/CP.4, it repeated the necessity to continue the endeavors of Parties to support and cooperate in the progress, application, distribution and transfer of technologies, and formulated. The decision also focuses on a list of issues and questions linked with technology transfer, and accordingly requested the Chairman of the Subsidiary Body for Scientific and Technological Advice (SBSTA) to launch a consultative course to think about those issues and questions.

COP 5:
COP 5 through its Decision 12/CP.5 decides that “the process shall also identify what actions are necessary under the Convention, including actions relating to funding, insurance and the transfer of technology, to meet the specific needs and concerns of developing country Parties referred to in Article 4.8 of the Convention and the specific needs and special situations of the

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92 See Decision 7/CP2 of COP2.
94 See Decision 9/CP3 of COP 3.
95 See Decision 4/CP.4 of COP 4.
least developed countries”. 96 Specifically Decision 9/CP.5 says about technology transfer and it “urges Parties included in Annex II to the Convention to give particular attention to reporting on technology transfer activities, as specified in part II of the revised guidelines for reporting by Parties included in Annex I to the Convention.”97

COP 6:
No noteworthy discussion or decision on transfer of ESTs has been found in COP 6, held in Hague, Netherlands.

COP 7:
Decision 4/CP.7 of COP 7, adopted as part of the Marrakesh Accords in 2001, includes agreement by Parties to work jointly on activities concerning transfer of ESTs, pursuant to the Article 4.5 of the Convention mentioning “…a framework for meaningful and effective actions to enhance the implementation of” transfer of ESTs. The annex to decision 4/CP.7 contains five main themes:
1. Technology requirements and requirements’ assessments;
2. Technology information;
3. Enabling environments;
4. Capacity building;
5. Method for transfer of technology.
However, the main things provided by the framework are catalog of actions which are served as guiding principles for governments and other concerned bodies. Decision 4/CP7 also decides “to establish an expert group on technology transfer to be nominated by Parties, with the objective of enhancing the implementation of Article 4, paragraph 5, of the Convention, including, inter alia, by analysing and identifying ways to facilitate and advance technology transfer activities and making recommendations to the Subsidiary Body for Scientific and Technological Advice. The Conference of the Parties will review at its twelfth session the progress of the work and terms of reference, including, if appropriate, the status and continuation of the expert group.”98

Thus, in connection with constructions under the UNFCCC, the technology framework identifies two parts:

96 See Decision12/CP.5 of COP 5.
97 See Decision 9/CP.5 of COP 5.
98 See Decision 4/CP7 of COP 7.
Firstly, the ingredient of technology information contains a web-based technology transfer clearing house (TT: Clear). TT: Clear takes in technology-related substance and programme descriptions of all five themes of the framework.

Secondly, the component of technology mechanisms consists of the Expert Group on Technology Transfer (EGTT), which is maintained by the UNFCCC secretariat and reports to both permanent subsidiary bodies under the UNFCCC.  

**COP 8:**

Decision 1/CP.8 (i) says about the sectors require technology transfer: “Technology transfer should be strengthened, including through concrete projects and capacity-building in all relevant sectors such as energy, transport, industry, health, agriculture, biodiversity, forestry and waste management. Technological advances should be promoted through research and development, economic diversification and strengthening of relevant regional, national and local institutions for sustainable development….\(^99\)

At the same time, decision 1/CP.8 (m) requires the Annex I Parties to “further implement their commitments under the Convention, including, for Annex II Parties, those relating to the provision of financial resources, technology transfer and capacity-building, and demonstrate that they are taking the lead in modifying longer-term trends in anthropogenic greenhouse gas emissions, consistent with the ultimate objective of the Convention...”\(^100\)

Besides, decision 6/CP.8 (c) also lays down some additional guidance to an operating entity of the financial mechanism as follows:

“On matters relating to transfer of technologies: provide financial resources to non-Annex I Parties, in particular the least developed country Parties and the small island developing States among them, in accordance with decision 4/CP.7, through its climate change focal area and the Special Climate Change Fund established under decision 7/CP.7, for the implementation of the framework for meaningful and effective actions to enhance the implementation of Article 4, paragraph 5, of the Convention, contained in the annex to decision 4/CP.7”

**COP 9:**

No noteworthy discussion on transfer of ESTs was found in COP 9 held in Milan, Italy.

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\(^99\) During the period of 2001 to 2007, the EGTT was responsible to report only to the Subsidiary Body for Scientific and Technological Advice (SBSTA). But as COP 13 in Bali 2007, has revised the terms of reference for the EGTT, it is now also reporting to the Subsidiary Body for Implementation (SBI).

\(^100\) See Decision 1/CP.8 (i) of COP 8.

\(^101\) See Decision 1/CP.8 (m) of COP 8
COP 10:
Decision 6/CP.10 (2) of COP 10 requests “the Expert Group on Technology Transfer to make recommendations for enhancing implementation of the framework for effective and meaningful actions to enhance the implementation of Article 4, paragraph 5, of the Convention (…) including innovative public and/or private partnerships, enhanced cooperation with the private sector, cooperation with the relevant conventions and intergovernmental processes, and medium- and long-term planning of the Expert Group on Technology Transfer, (….)”\(^{102}\)

COP 11:
COP 11 was held in Montreal in 2005. Regarding transfer of ESTs Decision 6/CP.11 (b) of COP11 urges the secretariat to: “organize a senior-level round-table discussion between Parties, international financing organizations, the private sector and other stakeholders at the twenty-fifth session of the Subsidiary Body for Scientific and Technological Advice to discuss and exchange views on issues, experience and lessons learned, and strategies for short-, medium- and long-term international technology cooperation and partnerships in the development, deployment, diffusion and transfer of environmentally sound technologies and know-how to enable more informed decisions on actions in the future.”\(^{103}\)

COP 12:
The perpetual argument over technology transfer became more piercing in COP 12, held in Nairobi in 2006, with parties offering extensively conflicting views on whether and how to expand the mandate of the Expert Group on Technology Transfer (EGTT). Until that date the EGTT had a main methodical role, analyzing a broad range of technology-related issues and serving countries assess technology needs and options. Through the preference of expiring the group’s mandate, developing countries saw a prospect to renovate it as a standing body with more powerful role in promoting the transfer of technologies from developed countries. Proposals incorporated formation of a Technology Development and Transfer Board with decision-making authorities, and institution of a Multilateral Technology Acquisition Fund to make technologies obtainable to developing countries by “wiping out” the “barriers” of intellectual property rights. But these proposals were sturdily opposed by developed countries. The Conference decided to keep the EGTT alive for one year more and to pass on the issues back

\(^{102}\)See Decision 6/CP.10 (2) of COP 10.
\(^{103}\)See Decision 6/CP.11 (b) of COP11.
to the Subsidiary Body for Scientific and Technological Advice in order to adopting a decision at COP 13. \(^{104}\)

**COP 13:**

At COP 13, in Bali, in addition to the reinforcement of EGTT with a five years mandate (2008-2012) a supplementary group of actions concerning transfer of ESTs were taken by governments and intergovernmental organizations. \(^{105}\) However, here parties have also laid down the “Bali Action Plan” \(^{106}\). This plan provides “a comprehensive process to enable …long-term cooperative action, now, up to and beyond 2012, in order to …adopt a decision at its fifteenth session” and more importantly it denoted the transfer of ESTs as one of four important pillars (para.1d) for future climate change negotiations of international forum.

The COP-13 actually agreed to reform the EGTT for a further five years (until 2012) providing mandate to work on the following major tasks for the first two years:

- Monitoring and building up a set of routine indicators in view to supervise and evaluate the success of the accomplishment of the TT framework and its subsequent set of actions.
- Identifying the existing and budding new funding resources in supporting transfer of ESTs, to appraise gaps and barriers to these funding resources and to make a report along with recommendations on future financing options.
- Preparing a policy paper, together with sectorial approach, on its long-standing viewpoint beyond 2012 to aid the development, dissemination, operation, and transfer of technologies under the Convention. \(^{107}\)

In connection with the issues of transfer of ESTs, the Bali Action Plan addressed as follows:

“(d) Enhanced action on technology development and transfer to support action on mitigation and adaptation, including, inter alia, consideration of:

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\(^{104}\) See Twelfth Session of the Conference of the Parties to the UN Framework Convention on Climate Change and Second Meeting of the Parties to the Kyoto Protocol, November 6-17, 2006, Nairobi, Kenya, available at http://www.pewclimate.org/what_s_being_done/in_the_world/cop12/summary.cfm (last visited on 19 December, 2010)

\(^{105}\) See Decision 3/CP.13.

\(^{106}\) See Decision 1/CP.13.

\(^{107}\) See Helen Plume, Enhanced action on technology development and transfer to support action on mitigation and adaptation, *Related on-going and completed work under the Subsidiary Body for Scientific and Technological Advice (SBSTA)*, p 3, available at http://unfccc.int/files/meetings/ad_hoc_working_groups/lca/application/pdf/sbsta_technology.pdf (last visited on December 21, 2010)
(i) Effective mechanisms and enhanced means for the removal of obstacles to, and provision of financial and other incentives for, scaling up of the development and transfer of technology to developing country Parties in order to promote access to affordable environmentally sound technologies;

(ii) Ways to accelerate deployment, diffusion and transfer of affordable environmentally sound technologies;

(iii) Cooperation on research and development of current, new and innovative technology, including win-win solutions;

(iv) The effectiveness of mechanisms and tools for technology cooperation in specific sectors; 

COP 14:

In COP 14, held in Poznan in 2008, developing countries demanded the necessity of departing from the commercial approach of Intellectual Property Rights (IPRs) in ESTs. At the same time they argued that the quantity of monetary resources for technology transfer is insufficient and should be considerably increased. Here, China urged to establish a “Multilateral Climate Fund” under UNFCCC in view to finance activities in developing countries particularly related to clean energy “research, diffusion and transfer”, while India urged for a faster and longer term focal point on “technology transfer.”

Among positive developments concerning technology transfer, governments agreed upon the Global Environment Facility’s “Poznan Strategic Programme on Technology Transfer” in view to increase investment in technology transfer.

However, despite some important forwarding steps, there remain some substantive gaps in the argument. Especially the issue of the management of the intellectual property was discussed but not solved in COP 14. 


109 See http://climatelab.org/Technology_Transfer (last visited on December 22, 2010).
COP 15:

In 2009, two major issues mentioned below were discussed at COP 15 in Copenhagen:

i. Structural frame work: What kind of structure will be in place after 2012 to administer transfer of ESTs?

ii. Funding: How much money will be obtainable for the transfer of ESTs? Who will be the decision making actor to decide where the money for the transfer of ESTs will be spent?

However, both the issues were extensively discussed by the Contact Group on Enhanced Action on Development and Transfer of Technology. Accordingly, concerning structural frame work, an extensive consensus on the necessity of building central unity was found. The central unity can be in the form of Executive Board of Technology, which will play role as coordinator or organizer of new Agreements concerning transfer of ESTs. Another extensive consensus was also found for technology-specific and/or regionally-specific organization and arrangement.

On the other hand, disagreements were found between the parties in several numbers of areas concerning funding. Some negotiating members of COP 15 disagreed with the concept of the necessity of fund for transfer of ESTs. Parties could not reach a consensus about the form of the proposed fund, as well. In this connection, intellectual property rights issues acted as a vital reason behind the divergences.

Although the issues concerning the transfer of ESTs has been mentioned for so many times in COP 15, and more than 30 sessions respectively, held by SBSTA and SBI, in practice, no noteworthy practical success has come out except a few theoretical consensus to the necessity of taking some steps.

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111 Id.

112 Id.
COP 16:

The most recent Conference of the Parties (COP 16) held in Cancun incorporated some important decisions on sustained, strengthened support to developing countries efforts in “adaptation and mitigation”, including solid “technology dissemination projects”\(^\text{113}\). The basic significance of COP 16 i.e. the Cancun Agreement is that, it has the most inclusive package ever agreed by the Governments of the member states.

Cancun 2010 re-utters the commitment of the Convention and urges developed country Parties “to strive to implement policies and measures to respond to climate change in such a way as to avoid negative social and economic consequences for developing country Parties, taking into account Article 3 of the Convention, and to assist these Parties in addressing such consequences by providing support, including financial resources, transfer of technology and capacity-building, in accordance with Article 4 of the Convention, to build up the resilience of societies and economies negatively affected by response measures.”\(^\text{114}\)

It reasserts the objective of enhanced action on technology development and transfer as: “to support action on mitigation and adaptation in order to achieve the full implementation of the Convention.”\(^\text{115}\) COP 16 further decides “to accelerate action consistent with international obligations, at different stages of the technology cycle, including research and development, demonstration, deployment, diffusion and transfer of technology”\(^\text{116}\).

Concerning the Technology Executive Committee COP 16 provides that, “the Technology Executive Committee shall further implement the framework for meaningful and effective actions …”\(^\text{117}\) Besides, it has decided to end the mandate of the Expert Group on Technology Dissemination at the conclusion of the COP 16.\(^\text{118}\)


\(^\text{114}\) See Draft decision no. 89 of COP 16.

\(^\text{115}\) See Draft decision no.113 of COP 16.

\(^\text{116}\) See Draft decision no.115 of COP 16.

\(^\text{117}\) See Draft Decision no. 119 of COP 16.

The most important feature of the Cancun Agreement is that, it has decided to establish a Green Climate Fund (GCF), which shall act under supervision of and shall also be liable to the Conference of the Parties. As the fund is created to assist projects, programmes, policies and other concerned activities of developing countries it is expected that the GCF shall also play an important role to promote the transfer of ESTs from developed to the developing nations.\(^\text{119}\)

Moreover, in view to ensure enhanced improvement and transfer of the environmentally sound technologies, COP 16 has established a Technology Mechanism with an expectation to come into operation in full swing by 2012. As a component of this mechanism, COP 16 has also established Technology Executive Committee (TEC), which will be engaged to work for the improvement and application of the new environmentally sound technologies. TEC shall also work to enhance public and private sectors' investment in development of environmentally sound technologies and smooth transfer of those. Besides, it is also responsible to recommend policies and actions to promote and enhance the concerned technology cooperation.\(^\text{120}\)

Another body named as Climate Technology Centre and Network (CTCN) has also been established by COP 16 as part of the Technology Mechanism to promote and facilitate national, regional and international networks or organizations concerning environmentally sound technologies. The main activity of the CTCN shall include mobilization and development of the international green technology capabilities. It shall be responsible to ensure prompt action on the proper utilization of the existing green technologies and to offer direct support to the developing countries. However, in view to ensure improvement and transfer of the up-and-coming green technologies, CTCN shall also work to form a harmonized collaboration with the public and private sectors, as well as with academic and research institutions.\(^\text{121}\)

In short, the Technology mechanism along with its subsidiary bodies can be an effective mechanism to combat the challenges posed by global climate change if it can ensure that the environmentally sound technologies are transferred “at the right place, at the right time and to best effect.”


\(^{120}\) Id.

\(^{121}\) See UNFCCC, The Cancun Agreement http://cancun.unfccc.int/financial-technology-and-capacity-building-support/increased-cooperation-on-technology-for-both-mitigation-and-adaptation/#c304 (last visited on April 22, 2011).
In addition to the above issues Cancun has also provided an Adaptation Framework, which has significant importance for the most vulnerable countries. Besides the core guideline for adaptation mechanism the framework requires the parties to ensure “Research, development, demonstration, diffusion, deployment and transfer of technologies” concerning climate-adaptation mechanism. Although paragraph 14(g) of the Framework explicitly mention about the transfer of green technology, the issue has also been implicitly mentioned in other places. The wordings “through international cooperation and coherent consideration” of the Paragraph 13 of the Decision 1/COP16 and the wordings “best available science” of Paragraph 12 of the Decision 1/COP16 can also be considered as implied indication of the transfer of technologies.

**Expectations from COP 17:**

The most important decisions concerning transfer of ESTs are expected to come out from COP 17 which is to be hosted by Durban, South Africa in 2011. Both industrialized and developing countries are getting themselves prepared to come into an agreement about the future climate change governance including technology transfer issues in Durban. In this connection it is an overreaching expectation that, the policy makers must go for such a deal concerning transfer of ESTs which may bring a sustainable solution of the existing tensions.

**7. COMMENT ON THE KYOTO PROVISIONS ON TECHNOLOGY TRANSFER**

If we consider the wordings “appropriate”, “cooperate”, “encourage”, “facilitate”, or “promote”, “exert efforts”, “assist” etc. of Kyoto Protocol, all those have such flexible meanings that actually do not ensure measures for transfer of ESTs. The wordings of the concerned provisions of the protocol do not impose specific binding commitments based on which the degree of compliance can be measured. Thus the major weakness of the protocol is lack of specific definition, kind of non-binding nature and vagueness of its obligations. Besides, the Protocol does not possess any effective “compliance mechanism”, which could take action against the

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122 See Paragraph 14(g) of the Decision 1 of COP16.
countries not complying with the provisions, rather the protocol rely on national measures for the implementation of its provisions, providing individual countries with substantial discretion. Lack of “punishment mechanism” should also be considered as a “fatal weakness”. In this connection, the Protocol directs the Conference of the Parties serving as the meeting of the Parties to the Protocol to approve suitable and effective procedures and mechanisms to establish and to deal with cases of non-compliance with the provisions of the Protocol. But in practice, no specific measures binding the parties have been laid down, let alone the sanctions for those countries who have failed to perform their obligations. Considering this issue, it can be figured out that the Kyoto Protocol is sometimes observed as those agreements, which are “soft international law” in nature.

On the other hand, although Kyoto Protocol lays down that, any procedure and mechanisms under the Article 18 concerning binding consequences shall be adopted through an amendment of the Protocol, it is really not easy to obtain an amendment regarding implementation of transferring of ESTs on account of conflicts of interest between industrialized and developing countries.

In addition, the conflicts between interests of private enterprises and the intervening activities of the governments of the countries, especially of the industrialized countries also work as an embargo for the said amendment. Thus, it is not surprising that, no implementing provisions have been adopted till today. Bonn Conference of 2001 has failed to come up with any agreement on this issue. However, the establishment of EGTT (established at COP7) has also not worked on the promotion of actual activities concerning transfer of environmentally sound technologies as the function of EGTT was almost limited providing appropriate consulting advice to the subsidiary bodies (SBSTA and SBI). In fact EGTT can raise the suggestions on perfecting the related international legal system.

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124 See Kyoto Protocol, supra note 66, Article 18.
126 Id.
8. COMPARISON OF THE UNFCCC PROVISIONS WITH THE CONCERNED PROVISIONS OF THE TRIPS

In addition to the lack of “hard” international law concerning the transfer of ESTs the following issues are widely considered as obstacle to the smooth transfer of the environmentally sound technologies: a) Intellectual property rights over the concerned technology; b) Weak infrastructure and poor implementation of laws and regulations of the developing countries; c) Poor local supporting industry Political and macroeconomic instability; and f) Trade barriers. Among these, the most contentious issue is the intellectual property rights. The developing countries argue that, ESTs’ patents owned by the corporations of the developed countries make it difficult for the enterprises of the developing countries to access to the information and knowledge for the development and deployment of ESTs. For instance, if the patent owners of ESTs of the developed countries deny providing license or permission to the enterprises of the developing nations, the latter nations cannot avail access to the ESTs. Thus, it is advocated that a mechanism like “compulsory licensing” should be introduced under which mechanism the owners of the intellectual property rights shall be paid properly but the owners shall be compelled to provide with license to the third parties of the developing and least developed countries for the utilization of the technologies owned by them. Kyoto Protocol does not contain any such provision and though TRIPS allows “compulsory licensing”, it is limited to public health sector.

Under this backdrop, if the provisions of Kyoto Protocol concerning technology transfer are to be successful, there will have to be a review of the connection between the intellectual property protection and transfer of ESTs. Observing the complex nature of the problem the legal arena of

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128 Id.
129 The Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS), negotiated at the end of the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) in 1994, is an international agreement that sets down minimum standards for many forms of intellectual property (IP) regulation as applied to nationals of other members of the World Trade Organization (WTO). It is administered by the World Trade Organization (WTO).
transfer of environmentally sound technologies may also be shifted from UN to WTO.\textsuperscript{131} But such proposal may not be suitable to many developing countries especially to those who cannot fully rely on WTO mechanisms.

As per the existing legal system of the world the protection of intellectual property rights under international treaty like TRIPs, and the domestic laws of the member states must get privilege over the “soft laws” concerning transfer of environmentally sound technologies. On the other hand, IPRs like patent over environmentally sound technologies are currently treated as private rights and the rights are retained either by private persons or by private entities. Moreover, it is also noteworthy that the financial profit of the owners of the intellectual property rights is directly attainable whereas the benefit of ensuring clean environment is not tangible and it also does not bring financial profit to any individual. Thus it is very usual that the individual owners of the intellectual property rights shall not sacrifice their instant profit to ensure the diffusion and transfer of environmentally sound technologies, unless any compulsory legal institution is created at international and subsequently at national level.\textsuperscript{132}

However, although two kinds of Governmental intervention in technology transfer e.g. i. Control of the governments over technology imports and exports, ii. Regulations of the contract applicable to an enterprise’s technology imports and exports, are currently available, the intervention of the Governments in contracts concerning technology transfer is all but essential in developing countries due to the weak negotiating capacity of the enterprises and due to the lack of strong role of competition laws. Developed countries very often refuse to transfer technology on developing countries due to the weak negotiating capacity of the enterprises and due to the lack of strong role of competition laws.\textsuperscript{133}

Thus for the assurance of the highest benefits from environmentally sound technologies it is arguable to adapt TRIPs and to admit the fact that ESTs should be protected under a special form of shield different from traditional intellectual properties. The question arises, is it possible to go for any special patent law for environmentally sound technologies? At COP 14 in Poznan and COP 15 in Copenhagen the issue of IPRs over ESTs was an important issue of debate.

\textsuperscript{131} Id.
\textsuperscript{132} Id.
\textsuperscript{133} Id.
between developed and developing nations. But unfortunately the issue did not receive required attention in COP 16.

9. LOOKING FORWARD

9.1 ESTs as a strategy feature of negotiation

Various kinds of proposals are found for the future international environmental agreement that will substitute the Kyoto Protocol and most of the proposals emphasis on the nature of mitigation targets and how those natures should be derived of.\textsuperscript{134}

Besides fixing reduction targets, the necessity of agreement on transfer of ESTs is highlighted by European Community (EC) as an inevitable element of future agreements.\textsuperscript{135} Similarly, the necessity of ‘parallel’ efforts including transfer of ESTs is also suggested to be considered as vital factor.\textsuperscript{136} However, a ‘hybrid’ approach of multinational agreements, state policies and procedures, and cap and trade (which in a broader sense can be fallen under transfer of ESTs) could be treated as a perfect policy for the future international agreements.\textsuperscript{137} It should also be kept in mind that, the effect of the simultaneous application of ‘technology push’ and ‘market pull’ work much higher than individual and separate application of those.\textsuperscript{138}

Nevertheless, it should not also be kept out of prediction that, the future agreements may provoke a broader aspect of support in favour of the ultimate packages based on the interests of

\textsuperscript{134}It is noteworthy that a good number of new entities and NGOs evolving as platforms for the discussion and explanation of climate change policy. Some entities or NGOs like Copenhagen Climate Council (2008), Climate Works (2008), focus their work on technology. These also include organisations formed to support messages from Al Gore, Tony Blair (2008), and Bill Clinton.


\textsuperscript{136} See Beyond 2012, International climate efforts, report of the Climate Dialogue at Pocantico, Pew Center on Global Climate Change, (Nov 2005).


the developed countries. In this context Sugiyama argues negotiators to, “…ensure that technology and development cooperation do not dilute political attention to climate change, and that the [carbon market] regime does not cripple technology and development cooperation by creating an adversarial negotiation atmosphere.”

As majority of the environmental policy was mainly based on technology-focused command-and-control regulation, it is also arguable that the regime should be shifted from process–based approach to outcome based approach. The national emission target idea of UNFCCC mainly focuses on market based policy approaches as tool of achieving the target and this approach provides the participants of markets with opportunity to determine which technological or other relevant issues are most effective to attain the requisite target.

On the other hand, technology based agreements may be argued as more effective than a system based on cap-and-trade or emission target. However, such kind of focused agreement may have option of doing demand to definite Parties, which means this kind of agreements are ‘transactable’, but would likely lead to a more scrappy regime for ESTs.

Meanwhile, Goldstein and Larson argue that “ability to reciprocate, and the trust that reciprocity will be provided through concessions” is one of the crucial components of international cooperation. Bagwell and Staiger opine that these components are used in International treaties and agreements. In this connection the term ‘reciprocity’ was divided by Keohane into –i. ‘specific’ (parties interchange items of comparable value in a firmly defined structure) and ii. ‘diffuse’. Although the difference between ‘specific’ and ‘diffuse’ is not explicitly demarked,

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139 See Bazilian, Morgan et al., Considering technology within the UN climate change negotiations, Energy Research Centre of Netherlands, November, p 20, (2008).


142 See Bazilian, Morgan et al., Considering technology within the UN climate change negotiations, Energy Research Centre of Netherlands, November, p 20, (2008).


it is argued that, in most of the cases agreements happen when less “diffuse” reciprocity occurs as the reciprocal value of the treaty is more understandable to the Parties in more “specific” reciprocity. However, in negotiations where technologies or environmentally sound technologies are concerned, more “specific” reciprocity lies there due to the fact that the parties have possibilities of accessing or supplying certain technologies. But in case of a technology-neutral cap and trade-based agreement, such benefits of involvement may not always be obvious and accordingly reciprocity will be more diffuse. This is an important reason to assess technology as an opportunity and a “reciprocity-enhancing” design feature of an international climate regime. The incentive to participate in such an agreement thus stems from the possibility of accessing such information, and whether countries foresee receiving advantage from it. This advantage may arise from being a key supplier, from having a high value context for a technology, such as a favorable wind regime, or from rural electrification challenges.

Besides, emission reductions schemes without the presence of technology do not afford the signing parties information about the effects on energy security, air quality and above all on sustainable development. On the other hand, policies based on technology provide clarification about the benefits and drawbacks and also provide greater level of certainty regarding charges and costs.

9.2 ESTs require a special approach

9.2.1 Seeking new forms

In theory two forms of technology transfer can be identified: i. Rearrangement or point-to-point transfer of new manufacturing or sales of technology, where ownership of manufacture remains in foreign hands, ii. The traditional embedding or schooling about technology

147 See Bazillian, Morgan . et el ., Considering technology within the UN climate change negotiations, Energy Research Centre of Netherlands, November, p 20, (2008).
148 Id ., at 21.
manufacture that is usually the subject of dialogue about technology transfer under the UNFCCC.

The first may also be compared with perpendicular incorporation of companies through the formation of subsidiaries, and the second is likened to the construction of joint ventures or other contractual relationships between different firms.\textsuperscript{151}

However, application of “vertical” or “point-to-point” technology transfer via international investment are considered to provide environmentally sound technology to new locations faster than conventional, “horizontal” forms of implanting. But the risk of this form of technology transfer is that the host country may not achieve long-term financial success from this particular technology. Another risk is that, the host country’s own competing technologies may lose competitiveness in comparison with the imported varieties.\textsuperscript{152}

\textbf{9.2.2 Seeking diversified or differentiated policies}

Although a mammoth growth has been occurred in the production and utilization of various kinds of ESTs during the last decade, the growth has actually been seen within some specific countries. For instance, while China and India have become vital actors for ESTs production and market, the other countries of Asia have not shown any significant development in this sector. Moreover, the plain statement about the operation of ESTs in developed and developing countries are also not always correct.\textsuperscript{153}

However, it is unquestionably clear that the employment of ESTs should follow diverse approaches considering specific local and regional conditions as well as the stage of the development of ESTs. Thus, the IEA notes, “…developing countries can offer opportunities to

deploy climate-friendly technologies more cheaply than in OECD countries. OECD technology deployment investments could therefore be enhanced if undertaken in these countries.”

The necessity of differentiated policies has been proved by the example of CDM. It is seen that, within very short time a large number of projects have been operated in some specific countries, yet a large part of Africa has received very small amount of investment. Besides, as the project developers are keen to achieve - emission reduction target through building up large scale market of low-cost abatement, another important target of CDM – sustainable development is harshly ignored.

9.3 Recommendations for the future mechanisms on transfer of ESTs

Seven typical generic policies are recommended by Eric Martinot et. el for smooth and successful transfer of environmentally sound technologies from the developed to the developing countries:

- Public-source funding (grants or loans),

- Supportive research and development (R&D) programs that prop up domestic technological development and dissemination,

- Building new institutions,

- Exchange of information,

- Easier “access” to technologies than free markets and multinational corporations would usually offer,

- Training and development of skills, and

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- Encouragement of worldwide joint ventures and/or private investment.\textsuperscript{157}

However, emphasizes are also given on building proper macroeconomic and policy environment for transfers and subsequently allowing markets “dictate technology choice and transfer modes”.\textsuperscript{158}

Heaton et al. analyse the types of policy changes necessary to achieve a technological “transformation” towards more environmentally sustainable technologies. According to the view of Heaton et al. successful technology transfer policies must:

- build available financial resources,

- trim down or eliminate barriers to technology transfer,

- sponsor capacity building within developing countries, and

- uphold new forms of intermediation or “technology brokering.”

Capacity building ought to target technology achievement, skills development, and local governments’ policies & institutions, whereas market intermediation is required to take into account the following issues:

- harmonizing technologies with applications,

- brokering joint venture,

- facilitating negotiations, and

- financing packages.\textsuperscript{159}


Later on, Heaton et al refuses the government policy as key model. Instead of mere “government policy”, they recommend partnerships and agreement amongst industry, academic world, international organizations, NGOs, and governments.\textsuperscript{160}

They propose disseminating ESTs through global commercial networks, improving business contracts for environmental technology cooperation, and forming environmental-technology investment corporations sustainably financed by private sources.

Moreover, they also opine in favor of “sector-specific environmental technology intermediaries”. Despite general accord that capacity building is a vital issue for ensuring transfer of ESTs the record of capacity building in practice is not that much satisfactory. In this connection Barnett\textsuperscript{161} concludes: “there is a great deal of uncertainty about precisely what capacities are needed and how they are developed. Unfortunately, experience suggests that the necessary competencies can, at best, only be improved slowly, and that many of the requirements are cumulative, and involve tacit and uncodified knowledge that is difficult to purchase on the international market.”

However, impediments against the promotion of the transfer of the environmentally sound technologies can never be solved without the efforts of the governments of all countries of the world. To solve the problems governments can take initiatives both in national and international levels. In national levels, governments, especially the governments of the developing and least developed countries through laying down suitable legal and economic policies should create such an environment where both private and public entities, joint venture companies and commercial industries will be encouraged to promote the transfer of ESTs. And at the same, in international level the governments of the states should create such an environment where the nations can come up with a uniform agreement containing such policy which shall instigate the demand as well as supply of the ESTs to attract the private sectors.\textsuperscript{162}

However, to ensure the successful compliance of both national and international duties and obligations of the nation states one effective proposition can be an International Technology Transfer (ITT) Agreement governed by WTO, which could ensure a linkage between transfer of ESTs and international trade, and could also bind the member states to implement its provisions by laying down national legislations obliging the private sectors to participate in the activities concerning transfer of ESTs. As WTO contains effective Dispute Settlement Body (DSB) and enforcement mechanism it can punish the parties not obliging with its provisions, and such mechanism could also help to overcome many barriers from the private sectors through intervention of the Governments of the parties to fulfill their obligations derived from ITT Agreement. However, as the proposal of such ITT contains a shift of the regime from UN to WTO, it will require a consensus from both developed and developing countries from the outset, which fully depends on the cooperation of the all member states. Thus, right now we can turn our focus of discussion to the UN regime of “technology transfer”.

Although, most of the discussions and decisions of the Conference of the parties of UNFCCC has not brought any consensus among all of the parties and most of those do not have any legally binding force, the negotiations are still going on to come up with an acceptable framework for the Post Kyoto Regime (after 2012). In connection with the issues of transfer of ESTs for the Post Kyoto Regime, apart from suggesting relaxation of Intellectual Property Rights through inclusion of some flexible provisions for environmentally sound technologies, the following recommendations are also considerable to ensure that the potential mechanism shall facilitate the successful transfer of ESTs:

i. Establishment of suitable set of laws and policies: Governments might encourage technology transfer through laying down rules and regulations of energy markets, energy effectiveness standards, environmental regulations, and energy and emission taxes.

ii. Activities suitable for Assistance: A technology transfer mechanism would only help the countries those agree to explicit short and long term intended goals, which should be subject to periodical review. These goals would be division of a national program that would be organized by the concerned states and approved by the technology transfer mechanism.

163 Id.
iii. Supervision of a Technology Transfer Mechanism: The International Mechanism of transfer of ESTs should be supervised by an Executive Committee consisting of the same number of representatives from both donors and recipients countries. Tariffs on Trades forced on ESTs are also required to be reduced or abolished.¹⁶⁴

10. Conclusion

The most important decisions concerning dissemination of ESTs are expected to come out from COP 17 which is to be hosted by Durban, South Africa in 2011. Both industrialized and developing countries are seemed to be prepared to come into an agreement about the Post Kyoto regime on COP 17. In this connection it is expected that the policy makers must go for such a deal concerning transfer of ESTs which shall be based on more scientific recommendations than political negotiation. It is also arguable that the expected agreement should not only focus on the mitigation approach but also prioritize the adaptation approach.

I would like to opine that, though Kyoto Protocol is the most relevant and effective international instrument concerning dissemination of environmentally sound technologies, it has not really satisfied its objective as per expectation. Lack of specific direction of technology dissemination and lack of specific enforcement procedures of the Protocol are two major draw backs, which are required to be resolved in future international environmental agreements.

To ensure the application of the substantive provisions of future international environmental agreements concerning the transfer of ESTs I would like to suggest building an international authoritative body, which must hold proper authority to investigate any complaint, to put their own decision and subsequently to implement the taken decision. To implement this concept I would like to propose to institute “International Climate Court”, which shall deal with not only the issues concerning the transfer of ESTs but also all other issues derived from the derogations from the provisions of binding international agreements concerning climate change.

Considering the importance and emergence of the issues fallen under its jurisdiction, the proposed “International Climate Court” should be empowered with special norms over other international dispute settlement authorities. “International Climate Court” may enforce their decision in the format of economic/trade barriers, which might be implemented through WTO. As the issues concerning transfer of technology is closely related with international trade, it is arguable that the punishment mechanism of noncompliance of the concerned provisions of international agreement should mainly concern trade barriers. Moreover, the proposed Court should also be empowered with an authority of providing other kinds of sanctions, which may be implemented as per the implementation procedures of the decisions of International Court of Justice (ICJ).

Last but not least, as it is yet to be decided whether the inclusion of intellectual property rights enhance the invention and dissemination of green technologies or impede the dissemination of the green technologies, both international environmental law and the intellectual property law may bind its member states to go for any *sui generis*\(^\text{165}\) protection for the environmentally sound technologies in view to ensure easy and smooth dissemination of those technologies.

\(^{165}\) A *sui generis* legal system is a kind of legal system, which is specifically designed to address the necessity of any particular issue.
List of References:


Cameron J. Hutchison, *Does TRIPS Facilitate or Impede Climate Change Technology Transfer into Developing Countries?* 3 U. OTTAWA L. & TECH. J. 520 (2006).


Climate Lab Beta, available at http://climatelab.org/Technology_Transfer (last visited on December 23, 2010).


Bazillian, Morgan . et el., Considering technology within the UN climate change negotiations, p 20, Energy Research Centre of Netherlands, November, (2008).
Climate Change 2007, the Fourth Assessment Report (AR4) of the United Nations Intergovernmental Panel on Climate Change (IPCC), is the fourth series of reports concerning issues of climate change.


Helen Plume, *Enhanced action on technology development and transfer to support action on mitigation and adaptation,* Related on-going and completed work under the Subsidiary Body for Scientific and Technological Advice (SBSTA), available at http://unfccc.Int/files/meetings/ad_hoc_working_groups/lca/application/pd/sbsta_technology.pdf (last visited on December 21, 2010)


Twelfth Session of the Conference of the Parties to the UN Framework Convention on Climate Change and Second Meeting of the Parties to the Kyoto Protocol, November 6-17, 2006, Nairobi, Kenya, available at http://www.pewclimate.org/what_s_being_done/in_the_world/cop12/summary.cfm (last visited on 19 December, 2010).

UN Department of Economic and Social Affairs, Division for Sustainable Development, Documents, archived at http://www.webcitation.org/5at3iTet3.


UNEP Risø, CDM project pipeline, consulted in October 2008, (2008), archived at www.cdmpipeline.org (last visited on Nov. 12, 2010).


UNFCC Adaptation, Technology and Science Technology Subprogramme, archived at http://ttclear.unfccc.int/ttclear/jsp/ (last visited on Nov. 16, 2010) (discussing the results of the survey on the effectiveness of the use of the UNFCCC technology information clearing house (TT:CLEAR)


UNFCCC, “Revision to the methodological tool ‘Combined tool to identify the baseline scenario and demonstrate additionality, http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-02-v2.pdf, (last visited on December 19, 2010).


