



International Centre for Trade
and Sustainable Development

ICTSD's work on Transfer of Technology, IPRs and MEAs

*Life Sciences Symposium:
Patent Landscaping and Transfer of Technology under MEAs*

**WIPO
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Background on the International Centre for Trade and Sustainable Development (ICTSD)

- **ICTSD was established in Geneva in September 1996. Its mission is to empower stakeholders in trade policy through information, networking, dialogue, well-targeted research, and capacity building, with a view towards promoting a sustainable development perspective in the international trade system.**
- **As an independent non-profit NGO, ICTSD engages with broad range of stakeholders, including governmental, non-governmental and inter-governmental actors. It plays a unique role as a provider of original, non-partisan reporting at the intersection of international trade and sustainable development.**
- **By helping parties become better informed about each other, ICTSD seeks to build bridges between groups with seemingly disparate agendas.**
- **ICTSD is accredited by the United Nations. It enjoys consultative status with a number of international organizations.**



ICTSD's Programme on IPRs and Sustainable Development

- ICTSD's Programme on IPRs and Sustainable Development aims at facilitating development oriented outcomes in international trade and IP related negotiations.
- Currently, IP programmatic activities focus on:
 - Integrating development concerns in international processes in the areas of trade and IP;
 - helping to implement IP norms that balance private rights and public interests;
 - maximizing incentives for innovation, creativity and technology transfer to developing countries;
 - promoting greater integration between IP, technology transfer, foreign direct investment and competition policies.
- The programme has contributed to advance the global IP agenda, in particular, through its series of *Bellagio Dialogues*, which were instrumental in promoting a more development oriented approach to IP issues at the international level.



Transfer of technology and IPRs

- Since early on, ICTSD sought to promote a better understanding of issues relating to transfer of technology and IPRs in order to advance international processes in this area, in particular through evidenced based policy oriented research.
- Examples of recent activities and publications include:
 - Geneva Dialogue, *Encouraging Technology Transfer to LDCs: Towards a More Effective Implementation of TRIPS Article 66.2*, organized with UNCTAD, 16 June 2008.
 - *Technology transfer in the TRIPS age: the need for new types of partnerships between the least developed and most advanced economies*, by Dominique Foray, EPFL, forthcoming 2008.
 - *Intellectual Property and Access to Clean Energy Technologies in Developing Countries An Analysis of Solar Photovoltaic, Biofuel and Wind Technologies*, by John H. Barton, George E. Osborne Professor Emeritus Stanford Law School, Issue Paper 2, Trade and Sustainable Energy series, December 2007.
 - *New Trends in Technology Transfer*, By John H. Barton George E. Osborne Professor Emeritus Stanford Law School, Issue Paper 18, IP and Sustainable Development Series, February 2007.
 - *Encouraging International Technology Transfer*, by Keith Maskus, Professor of Economics, University of Colorado at Boulder, Issue Paper No. 7, IP and Sustainable Development Series, May 2004.
 - *Nutrition and Technology Transfer Policies*, by John H. Barton, George E. Osborne Professor Emeritus Stanford Law School Issue Paper No. 6, IP and Sustainable Development Series, May 2004.



Main findings of ICTSD's work on transfer of technology and IPRs (I)

- **Transfer of technology (ToT) is a complex and multidimensional process.**
- **ToT relates to processes enabling technological knowledge moving from one entity - legal or natural persons - to another. Knowledge is embodied in goods and services, codified in blueprints, designs, know-how and technical documents**
- **ToT is not an automatic or costless process. One key aspect of the process is the development of domestic capacities to absorb and master external knowledge, innovate on that knowledge or on further technical change and commercialize the results of those endeavors.**
- **By offering protection against a loss of control of information in technology-related transactions, IP is an instrument aimed at facilitating the transfer of technology.**
- **On other hand, the existence of IP protection does not guarantee or suffice for effective transfer of technology. IPRs need to be buttressed by appropriate infrastructures, governance and competition systems in order to be effective.**



Main findings of ICTSD's work on transfer of technology and IPRs (II)

- There are three main modalities for ToT, particularly to developing countries:

i) market-based transactions;

Market or simply commercial transactions are driven by private actors and take place mainly through trade (acquisition of capital goods); technical consultancy; licensing of IPRs including know how; international subcontracting and various forms of foreign direct investment (FDI), including turnkey projects and joint ventures.

ii) non-market or informal transfers;

Non-market or informal modalities are driven by the interest of entities in acquiring technology by searching, identifying and obtaining available technical knowledge. This could take place by reverse engineering, legally copying, and upgrading existing products and services. The main sources would be: technical information contained in patent databases; technical and scientific publications including via Internet; technical visits, including studies in institutes of high learning; migration of skilled labour; It is recognized that, compared to the other modalities, informal ones could represent the hidden part of the iceberg.

iii) initiatives by international or non-profit organizations.

Initiatives that disseminate technical knowledge to developing countries in a variety of forms, including support or cooperative relationships with universities, research centers, enterprises, hospitals and training. ToT projects could be an important component of ODA and of development projects by NGOs and IGOs through financing, training and support for acquisition of capital goods, licensing, dissemination of the results of publicly funded R&D, and promotion of public-private partnerships (PPPs).



Main findings of ICTSD's work on transfer of technology and IPRs (III)

- **Developing local absorptive capacity:**

ToT should encompass not only the physical machinery and other infrastructure, but also the associated know-how and training to adjust equipment to local conditions and support for the mastery and sustained use of the technology. In addition, recipient countries should have a thorough understanding of what levels of innovation, science and technology infrastructure, creative activity and skills exist domestically. Investing in incremental innovations is an important opportunity to establish a strong local innovation and technological base.

- **Publicly funded R&D:**

Evidence shows that an important portion of R&D is publicly funded. Developed countries should take appropriate measures to encourage the dissemination and transfer of the results of publicly funded research activities to poorer countries in relevant areas for their socio-economic development. Access to publicly funded research should be encouraged through use of open access models and inter-institutional exchanges of technical information and scientific knowledge. This would include providing IT structures and training support for researchers and scientists to exploit such information, as well as building capacity to adapt it for local needs.

- **Middle-income countries:**

Emerging middle-income countries have developed, in past years, their technological capabilities in a significant manner, particularly in areas such as information technology, pharmaceuticals and manufacturing in general. Poorer countries can benefit from the experience and know-how of those countries, through partnerships, as they develop their own technological base.

- **Bilateral and Regional Trade Agreements:**


Regional trade agreements should contain provisions to promote technology transfer by, for example, including obligations on developed countries to provide tax credits or other fiscal benefits to companies that enhance technological capacity through their activities in the target countries.



Main findings of ICTSD's work on transfer of technology and IPRs (IV)

Public-Private Partnerships (PPPs):

- have made a useful contribution in past years in the area of public health
- offer novel possibilities that should be fully utilized in efforts to facilitate ToT to poorer countries
- The particular circumstances and conditions prevailing in poor countries are exacerbated by a suboptimal level of ToT in relation to their needs. New strategies are needed that acknowledge the importance of ToT projects, even in areas where the commercial returns are very low or non-existent. The challenge is to find new, operational mechanisms to incentivize private firms to participate in such operations. Such a strategy would likely require the provision of additional incentives within the framework of PPPs initiatives.
- The essence of PPPs would reside in the involvement of a third party which is specialized in linking public donors, private firms and local entrepreneurial activities. It would also manage the IPRs side.
- There might be a need for devising a special IP-regime tailored for PPPs that could provide a more effective environment ensuring both incentives for technology holders to be part of the transaction and a better and easier access for the local entrepreneurs.



Transfer of technology, and the climate change challenge

- **The momentum created by the global scale of the climate challenge should be used to set up effective mechanisms for making adequate clean technologies available to developing countries and to help them make use of these technologies.**
- **As this issue emerges as an essential component for any post-Kyoto global agreement, determination is needed to achieve concrete and tangible results in this area.**



IPRs and the transfer of climate change related technologies

- The UNFCCC calls on developed countries to take steps to promote ToT to developing countries (Article 4.5).
- The Bali Action Plan called for “enhanced action on technology development and transfer to support action on mitigation and adaptation, including, *inter alia*, consideration of:
 - (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 technology to developing country Parties in order to promote access to affordable environmentally sound technologies;*
- IP is not mentioned expressly in UNFCCC or Kyoto Protocol provisions on transfer of technology.
- However, IP was raised in the discussions of the Expert Group on Technology Transfer (EGTT).
- Several developing countries have stated that IP is one of the various obstacles that must be addressed in a systematic and cross-cutting manner to access clean technologies.



Main Findings of the Paper by Prof. John Barton (2007)

IP and Access to Clean Energy Technologies in Developing Countries An Analysis of Solar Photovoltaic, Biofuel and Wind Technologies (I)

- The main goal of the paper is to explore whether there are barriers, particularly IP barriers, to access clean technologies by developing countries in three sectors: **solar (Photovoltaic) energy, biofuel and wind energy**.
- The paper focuses on emerging countries such as **Brazil, China and India**.
- Main findings in each sector:
 - In the **PV sector**, developing nations are facing a loose oligopoly. IP is unlikely to be a significant barrier. Firms in India and China have been able to enter the industry.
 - For **biofuel technologies**, IP does not appear to be barring developing countries for accessing the current generation technologies. The harder question is about future or second generation biofuel technologies where methods, or enzymes, or new microorganisms are likely to be patented. At present, the most significant obstacles relate to trade barriers and distortions.
 - The **wind sector** appears to be the most concentrated of the three sectors. However, the industry is competitive enough for developing nations to be able to build wind farms with equipment without enormous IP costs. The greater challenge for developing countries is to enter the global market for wind turbines as existing industry leaders are hesitant to share cutting-edge technology out of fear of creating new competitors.

Summary of Main Findings of the Paper by Prof. John Barton (2007)
*IP and Access to Clean Energy Technologies in Developing Countries An Analysis of
 Solar Photovoltaic, Biofuel and Wind Technologies (II)*

<i>Technology</i>	Solar (PV)	Biofuel	Wind
<i>IP access limitations on current market for energy</i>	Few concerns over IP.	Essentially no concerns over IP.	Possible concerns over IP, but likely to involve at most a small royalty.
<i>Major developing country concerns in future market for energy</i>	Possible difficulties in obtaining advanced IP-protected technologies.	Possible barriers or delays in obtaining cellulosic technologies.	Possible risk of anticompetitive Behavior given concentration of industry.
<i>IP access limitations on entering the industry as a producer of key components or products</i>	Possible barriers or delays in obtaining or creating the highest quality production systems.	Possible concerns over access to new enzymes and Conversion organisms but at most a royalty issue.	Possible difficulty in obtaining most advanced technologies.
<i>Most important overall concerns in area.</i>	Access to government funded technologies, Standards.	Global trade barriers Access to government funded technologies, Standards.	Access to government funded technologies and plausible anti-competitive behaviour, Standards.



General conclusions of the Paper by Prof. John Barton (2007)
*IP and Access to Clean Energy Technologies in Developing Countries An
Analysis of Solar Photovoltaic, Biofuel and Wind Technologies (III)*

- There seem unlikely to be significant IP barriers to developing nation access to solar, biofuel and wind technologies.
- Each of the sectors is organized as an oligopoly at a key level of technology supply. Members of the oligopoly may have IP for which it would like to charge a high royalty, but it will be constrained by competition from the other members of the oligopoly, and, even more, by competition with alternate means of producing electricity or fuel.
- In some cases, patents may have worked to facilitate technology transfer.



Some conclusions of ICTSD preliminary work on transfer of technology, IPRs and climate change (I)

- **Need of more evidenced based research on transfer of technology and climate change.**
- **No comprehensive study on the impact of IPRs in the different categories of climate-related technologies has yet been undertaken.**
- **The initial work by John Barton shows that the impact of patents on access to solar, wind and biofuels technologies in major developing countries might not be significant.**
- **Some studies, as those by the European Patent Office (EPO) have noted the increasing number and scope of patent claims in wind energy and bio-fuels technologies.**



Some conclusions of ICTSD preliminary work on transfer of technology, IPRs and climate change (II)

Issues of licensing and competition

- Issues around licensing of climate change technologies require further enquiries.
- The interface between competition policies and IP might be relevant here:
 - Evidence is needed to have better understanding of existing practices including pricing.
 - Based on this evidence, there might be a need to consider appropriate domestic or international instruments to deal with compulsory licensing, abuses of dominant position, refusal to deal, essential facility.
- According to Prof. Barton:

“Concentration itself presents a most significant issue, should the relative small number of suppliers (of PV cell manufacture or manufacturing equipment, of biofuel manufacturing requirements such as enzymes, or of turbines or turbine equipment) cooperate in a way that would violate competition-law principles. Thus, there should be consideration of ways to ensure detection of possible violation of competition-law principles, especially in industries such as these where each nation may want to help its national champions.”



ICTSD initiative on climate technology and trade

- **This initiative was launched at the Bonn climate change talks on 4th June 2008.**
- **It is an informal platform composed of prominent international experts in transfer of technology with a view to identify research and knowledge gaps and priorities in this area and generate policy oriented outcomes and solutions which can be fed into the UNFCCC process**
- **Preliminary priorities and areas for future work include: patent landscaping, licensing practices and indicators for transfer of technology and financing**



Exploring other avenues to make transfer of technology more effective

- Greater use of Public Private Partnerships (PPPs)
- Addressing issues relating to technical standards (biofuels)
- Indicators for measuring transfer of technology
 - It is clearly difficult to devise effective usable and verifiable indicators; but doing so would be extremely valuable. This is particularly important in light of the language in the Bali Plan of Action that technology transfer must take place in a “measurable, reportable and verifiable manner.”
- Emphasis on developing and strengthening absorptive capacities
- Exploring different innovation models (prizes, open collaborative innovation, patent pools)
- Is it possible to compare climate change with access to medicines issue in relation to IPRs?



Directions for future research

- Need to carefully evaluate the likely impact of IPRs in the climate change technology area.
- In making such an evaluation, the number of patents in the area might not be the key issue but rather the licensing practices and whether effective IPR-based markups and royalty rates are likely to be substantial as in pharmaceuticals or only a minor portion of overall costs. This is essential to go beyond anecdotes.
- Examining patent landscapes, e.g. the structure and coverage of patents in a particular technological area.
- Description of climate-friendly technologies available in the public domain.



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thank you !
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