



International Centre for Trade  
and Sustainable Development

## **Ways to promote enabling environments and to address barriers to technology development and transfer**

**Submission by**  
**the International Centre**  
**for Trade and Sustainable Development**  
**(ICTSD)**

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## I- Promoting enabling environments and addressing barriers to technology development and transfer

Examining means to promote technology development and transfer to developing countries has been one of the important priority research areas of the ICTSD Programme on Innovation, Technology and Intellectual Property over the past decade. A number of ICTSD publications address this issue including:

- [Unpacking the International Technology Transfer Debate: Fifty Years and Beyond](#) by Pedro Roffe and Padmashree Gehl Sampath, (2012).
- [Fostering Low Carbon Growth: The Case for a Sustainable Energy Trade Agreement by ICTSD](#), 2012.
- [Realizing the Potential of the UNFCCC Technology Mechanism: Perspectives on the Way Forward](#), by Padmashree Gehl Sampath, John Mugabe and John Barton, (2012).
- [Meaningful Technology Transfer to LDCs: A Proposal for a Monitoring Mechanism for TRIPS Article 66.2](#), by Suerie Moon (2011)
- [Technology Transfer in the TRIPS Age: The Need for New Types of Partnerships between the Least Developed and Most Advanced Economies](#), by Dominique Foray (2009).
- [Fostering the Development and Diffusion of Technologies for Climate Change: Lessons from the CGIAR Model](#) by Carlos Correa, (2009).
- [Does TRIPS Art. 66.2 Encourage Technology Transfer To The LDC's?: An Analysis Of Country Submissions To The TRIPS Council \(1999-2007\)](#) by Suerie Moon (2008).
- [New Trends in Technology Transfer: Implications for National and International Policy](#), by John H. Barton, (2007).
- [Encouraging International Technology](#), by Keith E. Maskus (2004).

The body of knowledge and analysis generated by ICTSD in this area provides a comprehensive overview of challenges facing technology transfer to developing countries. It also includes a number of suggestions and recommendations on how to address some of these challenges that could be useful for the work of the TEC in this area.

A number of elements to be highlighted for consideration by the TEC include:

- Enhancing technology transfer requires actions both at the level of technology suppliers (through adequate incentives, effective implementation of technology transfer provisions in international instruments, developing collaborative R&D partnerships and arrangements with the participation of developing countries, finance technology transfer) and at the level of technology recipients (through the strengthening of national innovation systems and absorptive capacities).
- Public research institutions and R&D centres are willing to provide more favourable terms for the transfer of technologies and should be actively involved in the TEC's activities in addition to the private sector and other stakeholders. Lessons should be drawn from initiatives and arrangements where such

institutions and centres play a key role in technology diffusion (the case of the CGIAR system for instance).

- The weakness of technological capabilities in Least-Developed Countries (LDCs) presents important and unique challenges for successful development and transfer of climate change technologies. New partnerships and innovative solutions should be considered to overcome them. In addition, the experience gained in the implementation of initiatives and provisions relating to technology transfer to LDCs in other areas should be also considered. In this regard, the implementation of TRIPS Article 66.2, which requires developed countries to provide incentives for enterprises and institutions in their territories to promote and encourage technology transfer to LDCs, is particularly relevant to the TEC as a case study on how to best encourage technology transfer to LDCs.
- Intellectual property rights (IPRs) play an important role in technology development and transfer and thus should be addressed (see following section).
- Addressing barriers to trade in sustainable energy goods and services could facilitate the freer flow of technologies and associated service-related skills across borders. It could also contribute improve the ‘enabling environment’ in developing countries for the private sector to promote technology diffusion as well as enhance the readiness and absorptive capacities of developing countries in this area. One way to achieve this objective could be through a Sustainable Energy Trade Agreement (SETA).<sup>1</sup>

The TEC’s work in looking at means to promote enabling environments and address barriers to technology development and transfer should fully take into account the diversity of technological needs of countries and the their levels of development and technological advancement and avoid ‘one size fits all’ prescriptions.

## **II- The role of intellectual property rights in technology development and transfer**

Intellectual property rights (IPRs) play an important role as an incentive to technology development and innovation. They also impact on the transfer and diffusion of technologies. This duality is reflected in article 7 of the TRIPS Agreement according to which: “the protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations.”

### *a) ICTSD’s work on IPRs and climate change technologies*

ICTSD has extensively examined the role of intellectual property rights in the development transfer and diffusion of climate change technologies. Its policy oriented

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<sup>1</sup>See <http://ictsd.org/programmes/climate-change/a-sustainable-energy-trade-initiative/>

research has provided ground breaking analysis and empirical evidence in this area that is widely recognized and referred to in discussions and relevant publications.

Some of the highlights of its policy research in recent years include:

- [Intellectual Property and Access to Clean Energy Technologies in Developing Countries: An Analysis of Solar Photovoltaic, Biofuel and Wind Technologies](#), by John H. Barton (ICTSD, 2007) was among the first studies to use patent data to examine the role of intellectual property rights in access to clean energy technologies in a number of developing countries. The paper looks into the technology and industrial structure of three clean energy sectors: solar photovoltaic (PV), bio-mass for fuel and wind energy technologies and concentrates on three technologically advanced developing countries including Brazil, China and India.
- [Intellectual Property Rights and International Technology Transfer to Address Climate Change: Risks, Opportunities, and Policy Options](#), by Keith Maskus and Ruth Okedij, (ICTSD, 2010) combines legal and economic analysis to provide a comprehensive overview of the issues and challenges facing the role of intellectual property rights in relation to both the development and dissemination of climate change technologies.
- [Patents and Clean Energy: Bridging the Gap between Evidence and Policy](#) by the United Nations Environment Program (UNEP), the European Patent Office (EPO) and the International Centre for Trade and Sustainable Development (ICTSD) (2010) presents the findings from a comprehensive mapping of clean energy technologies, a patent landscape for clean energy generation technologies and the first global survey of clean energy licensing practices. A groundbreaking outcome of the study has been the creation by EPO of a new patent classification scheme for clean energies and a searchable database now available on the EPO's patent information service (esp@cenet).

In addition, other publications by ICTSD have looked at lessons from the global debate on intellectual property and public health<sup>2</sup> for efforts to foster innovation and technology transfer to address climate change as well as challenges facing small developing countries in this area.<sup>3</sup>

Finally, in [Overcoming the Impasse on Intellectual Property and Climate Change at the UNFCCC: A Way Forward](#) by A. Abdel Latif, K. Maskus, R. Okediji, J. Reichman and P. Roffe (ICTSD, 2011), a number of principles and parameters are suggested for addressing the issue of intellectual property rights under the UNFCCC framework taking into account of their role in technology development and transfer.

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<sup>2</sup> [Innovation and Technology Transfer to Address Climate Change: Lessons from the Global Debate on Intellectual Property and Public Health](#), by Frederick M. Abbott, ICTSD Programme on Intellectual Property Rights and Sustainable Development, Intellectual Property and Sustainable Development Series, Issue Paper No. 24, June 2009.

<sup>3</sup> [Technologies for Climate Change and Intellectual Property: Issues for Small Developing Countries](#), ICTSD Programme on Intellectual Property Rights and Sustainable Development, Information Note No. 12, October 2009.

## b) *Key findings*

ICTSD's policy oriented research includes extensive data and findings on trends in patenting and licensing in a number of climate change technologies, including in relation to developing countries. It also identifies challenges, knowledge gaps in this area and provides a number of recommendations on how to address them.

This body of knowledge points to the following:

- Patenting in clean energy generation technologies has increased at a rate of 20 percent annually since the adoption of the Kyoto Protocol (1997), outpacing traditional energy sources of fossil fuels.
- Patenting is dominated by a handful of OECD countries (Japan, the United States, Germany, the Republic of Korea, the United Kingdom, and France) which account for almost 80 percent of patent filings with a number of emerging economies showing increasing specialization in some individual sectors.
- There is an untapped licensing potential towards developing countries.
- While the role of intellectual property rights in incentivizing innovation in a climate change technologies, particularly important mitigation technologies is well established, their impact on technology diffusion and transfer is more complex because it varies from one technology/sector/developing country to another, and is often difficult to isolate from a variety of other economic and institutional factors.
- A number of IPRs related initiatives and measures have been launched by a variety of stakeholders, including governments and the private sector, to accelerate clean energy innovation and diffusion and include: new search and classification tools to facilitate access to information on IPRs and clean energy technologies, schemes for fast tracking 'green' patent applications, initiatives for facilitating technology licensing, the creation of patent commons and IP exchanges and open innovation.<sup>4</sup>
- There is a pressing need for increased availability of reliable and objective information on IPR aspects of climate change technologies particularly with regard to climate change adaptation and at the country/sector level in developing countries.

## c) *The role of the Technology Executive Committee (TEC)*

The creation of the Technology Mechanism, along with the Green Climate Fund, makes the UNFCCC the appropriate forum to address all issues impacting the development, transfer and diffusion of climate change technologies, including intellectual property rights, from a holistic perspective.

It is difficult to envisage a credible approach to work on technology development and transfer without considering the role of intellectual property rights.

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<sup>4</sup> A, Abdel-Latif, [Intellectual Property Rights and Green Technologies from Rio to Rio: An Impossible Dialogue?](#) Policy Brief No. 14, ICTSD, 2012.

As the policy body of the Technology Mechanism, the TEC could contribute to a better understanding of the impact of intellectual property rights on development and transfer of climate change technologies without prejudice to the positions of countries on this issue in broader discussions under UNFCCC.

This could be achieved through technical discussions that are informed by empirical evidence and concrete examples. The outcome of such discussions should not be prejudged in advance. At a first stage, the TEC could undertake the two following tasks:

*i. Reviewing empirical evidence regarding the effects of IPRs on the transfer of climate technologies and addressing knowledge gaps*

As a first step, the TEC could begin by reviewing the existing empirical evidence regarding the effects of IPRs on the transfer of climate technologies and then endeavor to address some of the knowledge gaps in this regard, such as with regard to climate adaptation technologies and in relation to the country/sector level in developing countries. Such task would fall under function a) of the TEC's mandate in accordance with COP decision 1/CP.16: "Provide analysis of policy and technical issues related to the development and transfer of technologies for mitigation and adaptation."

*ii. Facilitating collaboration with a view to increasing availability of reliable and objective information on IPR aspects of climate change technologies technology*

One of the key findings of the UNEP-EPO-ICTSD study on Patents and Clean Energy was that gathering, analysing and providing access to information on clean energy technologies, including IPRs and licensing aspects, is a costly and complex task. It "involves a wide and diverse set of actors such as governments, IP authorities, the private sector, international and regional organisations, academic experts and non-governmental organisations." The study thus identified "a need to foster partnerships and collaboration between such actors in order to combine their different skills and expertise."<sup>5</sup>

In February 2011, ICTSD made a submission to the UNFCCC regarding the need for greater availability of technological information to promote cost effective mitigation actions. The submission underlined that rapid and affordable access to information on patenting of technologies for addressing climate change can significantly enhance the cost-effectiveness of mitigation actions. It argued that more tools and mechanisms in this area are urgently needed to enable further deployment and diffusion of existing technologies as well as to spur new technological innovation world-wide.<sup>6</sup>

The TEC with its comprehensive approach to development and transfer of climate change technologies is uniquely positioned to foster and facilitate partnerships and collaboration to address the need for greater technological information mentioned above. Such action would fall under functions d) and f) of the TEC's mandate in accordance with COP decision 1/CP.16.<sup>7</sup>

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<sup>5</sup> UNEP, EPO and ICTSD, (2012) *Patents and Clean Energy*, p.68

<sup>6</sup> The submission is available at: <http://ictsd.org/i/publications/105628/>.

<sup>7</sup> d) promote and facilitate collaboration on the development and transfer of technologies for mitigation and adaptation between governments, the private sector, non-profit organizations and academic and

After having completed these tasks, and on the basis of the analysis and empirical evidence undertaken and the information retrieved, the TEC could possibly discuss policies and actions under its other functions.<sup>8</sup>

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research communities; f) Seek cooperation with relevant international technology initiatives, stakeholders and organizations, and promote coherence and cooperation across technology activities, including activities under and outside of the Convention;

<sup>8</sup> In particular functions: b) Consider and recommend actions to promote technology development and transfer, in order to accelerate action on mitigation and adaptation; d) Recommend guidance on policies and programme priorities related to technology development and transfer with special consideration given to the least developed country Parties and e) Recommend actions to address the barriers to technology development and transfer in order to enable enhanced action on mitigation and adaptation;