

SUPPORTING INNOVATION TO MEET CLIMATE CHANGE CHALLENGES

POLICY STATEMENT FOR SUBMISSION TO UNFCCC COP-21

Prepared by the ICC Commission on Intellectual Property and the
ICC Commission on Environment and Energy

Summary and highlights

- The importance of innovation
- Enabling policies for clean technology innovation
- Existing mechanisms to bridge the technology gap
- The role of intellectual property rights in clean technology innovation and deployment
- The appropriate forum for IPR discussions is the WTO TRIPS Council

ICC, and the global business community it represents, believes that innovation is key to addressing many of the world's challenges today, including that of climate change. Innovation fuels economic competitiveness, creates jobs, and helps ensure that technology and manufacturing enterprises continue to contribute social and economic value to the global economy as a whole.ⁱ ICC is therefore highly supportive of efforts by the United Nations (UN) and other intergovernmental organizations to encourage technological innovation in general, and innovation in environmentally sustainable technology in particular. ICC especially supports efforts aimed at creating effective policy and regulatory environments around the world that encourage innovation and enable the development, broad dissemination, and use of innovative products and technologies.

To achieve its aims to find solutions for fighting climate change and adapting to its effects, the UN Framework Convention on Climate Change (UNFCCC) and its Parties must provide a framework which supports and encourages innovation. Fostering innovation is one of the post-2015 Sustainable Development Goals and is supportive of achieving other sustainable development goals, such as ending poverty and hunger, ensuring access to energy and health and promoting sustainable economic growth. The UNFCCC should embrace and support the development of positive technology enabling environments, innovation-focused government and market policies and regulation, as well as a more active and engaged role of the business community at large. In this regard, ICC and its members urge negotiators in the UNFCCC process to consider the following key points:

- **An effective response to climate change requires clean innovation on a global scale, *i.e.*, the development and diffusion of a broad variety of new clean technologies in both developed and developing countries.**
 - There is broad consensus that clean technology innovation is key to addressing the global challenge of climate change. Indeed, many existing clean technologies already deliver considerably improved environmental performance compared to other technologies. In particular, they are more protective of the environment, display lower pollution levels, deploy resources in a more sustainable manner, recycle a higher share of their wastes and products, and/or treat residual wastes in an environmentally more acceptable way.ⁱⁱ
 - Clean technologies fall into two categories: mitigation and adaptation. Mitigation technologies aim to reduce emissions of greenhouse gases or to capture them, while adaptive technologies allow users to adjust to negative effects of climate change, or exploit positive ones.ⁱⁱⁱ
 - Innovation comprises two dimensions: technology development and technology diffusion. Technology development refers to the use of scientific knowledge to obtain solutions. By contrast, technology diffusion is the process by which new technologies are transmitted from one party to another. Climate-friendly technologies, no matter how advanced, clearly do not serve their purpose until they are actually deployed and used. A meaningful solution requires the world to collectively embrace a broad array of clean technology solutions, many of which are already widely available on the market today.
 - Many clean technology solutions are already being developed and deployed by private sector actors.^{iv} Indeed, in most instances, a range of technological solutions are available from a range of market players, who compete amongst each other to address the same core sets of mitigation or adaptation challenges. The markets, in this sense are properly functioning, although in numerous situations trade barriers continue to cause prices to be higher than they would otherwise be.

- Technologies are also being transferred and shared, through commercial partnerships, collaborative innovation frameworks, and bilateral or regional government-to-government or private sector technology and innovation partnerships.

Box 1: Clean technology transfer to emerging markets – innovative solar power plants for China and India

This case study illustrates how IPR can facilitate the transfer of low-carbon technology to emerging economies.

A Californian startup founded in 2007, eSolar develops solar power plants using flat mirrors, or heliostats, to concentrate sunlight onto a centrally located water tank suspended from a tower. Since the mass-manufactured components are designed for rapid construction, uniform modularity and unlimited scalability, the company can offer cheap utility scale power plants, thereby achieving a significant competitive advantage.

In 2010, eSolar partnered with two companies in emerging markets willing to deploy its innovative technologies. Penglai Electric Company, a privately owned Chinese electrical power equipment manufacturer, will construct 2GW of solar thermal power plants in China by 2021, one of the largest solar thermal projects in the country. Indian developer ACME will build, own and operate 1GW of solar power plants in India. Furthermore, it will collaborate with other companies to build additional plants using eSolar's technology. As a part of the deal, ACME will make a USD 30 million equity investment in eSolar.

eSolar has protected its innovations by filing patent applications both in the US and internationally, relating to solar receivers, tracking control systems for heliostats, and heliostat array layouts. Both deals were structured as master licensing agreements that grant Penglai and ACME exclusive rights to use eSolar's technologies in their respective home markets.

Eligible for protection in China and India, eSolar's international patent applications have helped the company to find partners in emerging economies. It is unlikely that Penglai and ACME would have invested in such large-scale projects without the exclusivity in their domestic markets provided by the licensing agreements. Without these exclusive and enforceable rights, Penglai and ACME would have no protection against competitors copying the technology in question in their home markets. What is more, the exclusive licensing protects both companies against eSolar's concluding similar deals with other developers in China and India.

Source: Lane E (2011) Clean Tech Intellectual Property. OUP.

- **A number of key “enabling policies” can effectively help foster technology innovation.**

- In order to offer an optimal innovation and technology environment, both developed and developing countries need to define and implement policies that attract innovators from abroad, encourage investment in innovation, and stimulate domestic innovation and collaborative technology partnerships both within the country and across borders. This will help both their companies, consumers, and the economy as a whole to move up the innovation value chain.^v
- Innovation- and technology-enabling measures include competitive tax rates, tax incentives for R&D and investment, capital depreciation, a tax regime that enables the exchange of know-how through IPRs, tax holidays, and geographic tax free zones.^{vi}
- Innovation-enabling measures also include overall regulatory stability, including for environmental standards and other regulations, and a solid, reliable, and stable legal and administrative environment. This critical innovation infrastructure enables firms to innovate as well as lays the groundwork for public private partnerships.
- Governments can also foster further innovation through investments in infrastructure (roads, ports, pipelines, and transport, reliable access to electricity, or high-speed internet access), policies to encourage and enable Foreign Direct Investment (FDI), and a robust global market mechanism as a co-financing tool that can assist in integrating a country into global supply chains. More broadly, innovation requires a robust investment and financing infrastructure to allow innovators and entrepreneurs to set up and expand their businesses and invest in

technology development and commercialization. A key element in obtaining financing is intellectual property rights.

- Innovation in high technology also requires consistent investments in education -- particularly advanced research institutions -- and ongoing training for the workforce, as well as putting in place an effective expatriate tax regime and visa policies that enable immigration and integration into the workforce of skilled foreign workers.
 - Market mechanisms have proven their value in directing private capital and facilitating access to private technologies. Such mechanisms must remain an integral option within the architecture of any new global approach to effectively and efficiently combat climate change.^{vii}
- **With these enabling factors in mind, the UNFCCC and the international community at large have already taken a number of steps to help developing countries bridge the technology gap and for nations collectively to put in place policies and instruments that will help both encourage climate-related innovation, and to develop, commercialize and further disseminate new and existing technologies as needed.**
- The UNFCCC Technology Mechanism, including the Technology Executive Committee (TEC) and Climate Technology Centre and Network (CTCN), plays a key role in helping developing countries identify their technology needs and policies to address them. Currently, the major challenge is to move from need assessments to actual implementation.
 - The UNFCCC Green Climate Fund supports projects, programmes, policies and other activities in developing countries. Currently, discussions focus on additional funding being made available—a key challenge for many of the poorest countries in the world.^{viii}
 - At the World Trade Organization (WTO), negotiations are underway to reduce to zero import tariffs on a broad range of environmental goods, making them more cost-effective and easier to deploy for the benefit of customers and users worldwide.
 - A range of bilateral and regional initiatives aim to increase technology cooperation, as well as development of key new technologies to address some of the most urgent climate-related needs. For example, last year, the United States and China announced a new bilateral climate change agreement.^{ix}
 - It is important to note that all these efforts involve representatives from business, to take advantage of its real-world experience in developing and disseminating technologies. Effective mechanisms should be created to further institutionalize such involvement and make it more permanent. This could be modeled, for example, on the Private Sector Advisory Group under the Green Climate Fund or similar bodies at the OECD and International Telecommunications Union.
- **Stable and effective intellectual property rights protection for clean technology-related IPRs support the development, deployment and use of clean technologies. IPRs are a prerequisite and not a barrier to access. Weakening IPR would be extremely counterproductive to clean technology development and dissemination.**
- Evidence clearly demonstrates that IPRs do not impede technology innovation, but operate as a positive enabling factor for developed and developing countries alike. A vast body of economic and policy research confirms that IPRs play a positive role in the development and

diffusion of new technologies.^x In fact, they are one of several key incentives needed to encourage innovation.

- In particular, the protection of intellectual property ensures that businesses can recoup their investments in R&D and allows them to justify making investments in clean technology. For larger companies, IPRs play an essential role in making an internal business case for investment in a certain category of products or business unit. For smaller and mid-sized companies, including innovative start-ups, IPRs are key in attracting outside investment and monetizing development and innovation that is taking place.
- IPRs also help provide the security necessary for sharing of know-how between businesses and other entities in the context of collaborative innovation. This type of innovation, also referred to as “open innovation”, is especially important for highly complex technologies like clean technologies.^{xi} In general, their development cannot occur entirely within the boundaries of a single firm but necessitates the exchange of know-how with external actors.^{xii} Effective IPR protection is a prerequisite for technology partnerships and collaboration.
- Predictable and well-enforced IPRs contribute to technology diffusion on an international scale by facilitating the management of intellectual property in technology transfer transactions, such as licensing agreements.^{xiii}
- In addition, IPR-driven innovation fuels economic competitiveness, creates jobs, and helps ensure that technology and manufacturing enterprises continue to contribute social and economic value to local communities, regions and the global economy as a whole.^{xiv}
- Suggestions that IPRs constitute a “barrier” to technology transfer in the developing world lack any basis in either academic literature or the actual reality on the ground. In the vast majority of developing countries, some or all of the available technologies are not protected by IPRs, either because patent terms have already lapsed, or because the countries involved do not have an active functioning IPR system^{xv}. Yet, technology transfer is not necessarily effective in those countries, clearly demonstrating that the existence of IPRs is not in itself a barrier to technology transfer. In reality, IPRs can only function to transfer technology if the receiving country has the appropriate absorptive capacity, including a work force with the relevant technological skills, and necessary infrastructure and equipment. IPRs are a key element supporting technology transfer but must be complemented with other elements to fulfill their function of fueling and fostering innovation, competition and technological progress across borders.
- Even where IPR protection does cover a certain technology, it is important to underscore that in the vast majority of cases, IPRs represent only a small part of the overall cost of clean technologies. Clean technology markets, by and large, are defined by active and aggressive competition between technology, product, and services providers, leaving no room for technology owners to demand anything like monopoly pricing.^{xvi} Any excessive costs, moreover, are seldom if ever related to particular technologies involved, but are rather a factor of the vast scale at which solutions are needed and their overall operational complexity (e.g. large-scale hydroelectric plants, major adaptation-related infrastructure projects, etc.).
- **The WTO TRIPS Council is the appropriate forum, from a legal and institutional view point, for any IPR discussion.**^{xvii}
 - IPR-related issues are more effectively addressed in venues other than the COP21 negotiations, where they have proven to be divisive from a negotiating standpoint, and distract from some of the key challenges at hand within UNFCCC.

- In contrast, from the perspective of legal and institutional coherence, and based on the requisite expertise to discuss trade-related IPR issues, the WTO TRIPS Council is the appropriate venue for any discussions concerning IPRs. In fact, such discussions are already taking place.
- Finally, it is important to note in this context, that even seemingly harmless references within the UNFCCC and otherwise, to “discuss”, “reference” or “rebalance” IPRs, as well as references to “technology transfer”, “barriers to technology transfer”, or to the WTO TRIPS Agreement, can create uncertainty for potential innovators, making it more challenging to allocate capital to technology development and its dissemination. Among other things, such language creates significant legal confusion, involving the exact relationships between various (pre-) existing international legal agreements and the views of the courts.

ⁱ One recent study has indicated that companies owning IPRs tend to have almost 6 times more employees than companies that do not; their revenue per employee is 29% higher on average; they pay wages that are on average 20% higher than firms that do not; about 40% of large companies own IPRs; and although only 9% of small businesses own IPRs, the firms that do have almost 32% more revenue per employee than firms that do not. Office for Harmonization in the Internal Market [OHIM] (2015) Intellectual property rights and firm performance in Europe: an economic analysis. Firm-Level Analysis Report. OHIM, Alicante.

ⁱⁱ UN (1993) Agenda 21, Chapter 34, United Nations Document A/CONF.151/26/Rev. 1, Vol. I, Annex II.

ⁱⁱⁱ UNFCCC (2006) Technologies for Adaptation to Climate Change. Climate Change Secretariat (UNFCCC), Bonn.

^{iv} For example, in China, a U.S. technology company has formed a joint venture with a Chinese company to develop aeroderivative gas turbines, a significant advancement in green energy generation. In Brazil, a European firm has engaged in local partnerships to develop high-technology wind turbines for five power plants.

^v Lybecker KM & Lohse S (2015) Innovation and Diffusion of Green Technologies: The Role of Intellectual Property and Other Enabling Factors. Global Challenges Report. WIPO, Geneva; UN (2011) U.N. Conference on Trade and Development, Foreign Direct Investment, the Transfer and Diffusion of Technology, and Sustainable Development, *available at* http://unctad.org/en/docs/ciiem2d2_en.pdf; Johnson DKN & Lybecker KM (2009) Innovating for an Uncertain Market: A Literature Review of the Constraints on Environmental Innovation. Colorado College Working Paper 2009-06; Newell R (2008) *International Climate Technology Strategies*, 25-27 (Harvard Project on Int'l Climate Agreements, Discussion Paper 08-12; Lippoldt D (2011) Patent rights, developing countries and the economic influence of the global grading system. PhD thesis. Institut d'Etudes politiques de Paris; U.N. Framework Convention on Climate Change (2003) Enabling Environments for Technology Transfer, *available at* <http://unfccc.int/resource/docs/tp/tp0302.pdf>.

^{vi} PricewaterhouseCoopers (2010) Innovation: Government's Many Roles in Fostering Innovation, *available at* <http://www.pwc.com/gx/en/technology/pdf/how-governments-foster-innovation-2010.pdf>; Lybecker KM & Lohse S (2015) [n 3].

^{vii} ICC Commission on Environment and Energy (2010) Market Mechanisms in the post-2012 GHG Regime: Role and Shape of Future Greenhouse Gas and Carbon Markets.

^{viii} Green Climate Fund, *available at* <http://news.gcfund.org/>.

^{ix} U.S.-China Joint Announcement on Climate Change, (November 2014), *available at* <https://www.whitehouse.gov/the-press-office/2014/11/11/us-china-joint-announcement-climate-change>.

^x For a review of recent literature, see Lybecker KM & Lohse S (2015) [n 3].

^{xi} For a detailed discussion of the role of IPRs in open innovation, see Brant J and Lohse S (2014): The Open Innovation Model. International Chamber of Commerce. Innovation and Intellectual Property Series, Research Paper No. 2. International Chamber of Commerce, Paris; Carraz R, Nakayama I, Harayama I (2014) Openness,

Open Innovation à la Chesbrough and Intellectual Property Rights. In: Madiès T & Guellec D, Praeger JC (eds) *Patent Markets in the Global Knowledge Economy: Theory, Empirics and Public Policy Implications*. Cambridge University Press.

^{xii} For instance, a wind turbine represents an extremely complex technology. Aside from the visible parts of the wind turbine such as the nacelle, the blades and the tower, a wind turbine consists of a number of highly specialized parts adapted to or developed just for the wind energy sector.

^{xiii} For numerous examples illustrating how IPRs underpin the transfer of clean technologies to developing countries, see Lane EL (2011) *Clean Tech Intellectual Property. Eco-marks, Green Patents, and Green Innovation*. Oxford University Press, New York.

^{xiv} One recent study has indicated that companies owning IPRs tend to have almost 6 times more employees than companies that do not; their revenue per employee is 29% higher on average; they pay wages that are on average 20% higher than firms that do not; about 40% of large companies own IPRs; and although only 9% of small businesses own IPRs, the firms that do have almost 32% more revenue per employee than firms that do not. Office for Harmonization in the Internal Market [OHIM] (2015) Intellectual property rights and firm performance in Europe: an economic analysis. Firm-Level Analysis Report. OHIM, Alicante.

^{xv} 1% of the world's clean energy technology related patent applications from 1980 to 2009 have been filed in Africa and about 3% in Latin America. See UNEP and EPO. Patents and clean energy technology in Africa. 2013. Available at <http://www.epo.org/news-issues/technology/sustainable-technologies/clean-energy/patents-africa.html> and UNEP and EPO. Patents and climate change mitigation technologies in Latin America. 2014. Available at <http://www.epo.org/news-issues/technology/sustainable-technologies/clean-energy/patents-latin-america.html>

^{xvi} Barton J (2007): Intellectual Property and Access to Clean Energy Technologies in Developing Countries. ICTSD Issue Paper No. 2. International Centre for Trade and Sustainable Development (ICTSD), Geneva.

^{xvii} Ad Hoc Working Group on the Durban Platform for Enhanced Action, Negotiating Text (February 12, 2015), available at https://unfccc.int/files/bodies/awg/application/pdf/negotiating_text_12022015@2200.pdf.



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