



**AIPPI Standing Committee <sup>1</sup> on  
Intellectual Property and Green Technology**

**Report**

**Climate Change and Environmental Technologies –  
The Role of Intellectual Property, esp. Patents**

A contribution to the climate change debate, where the role of the IP system is sometimes critically viewed. Specific focus is put on the issue of technology transfer, particularly from industrialized to developing countries. The various arguments and suggestions are discussed and conclusions taken, comprising specific proposals for further procedure.

Date: September 2014 <sup>2</sup>

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<sup>1</sup> For details of members and countries involved, please refer to Annex 1 at the end of this Report.

<sup>2</sup> The research the subject of this Report is current as at May 2014.

## AIPPI Standing Committee (SC) <sup>1</sup> on Intellectual Property and Green Technology

### Introduction and Executive Summary

The role of intellectual property (IP) in the development and commercialization of technologies for mitigation of, and adaptation to, climate change has been much debated in various fora including, *in particular*, the Conferences of the Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC). An important point of discussion therein was, and continues to be, on the licensing of IP and transfer of technology, especially to developing countries in need of “accelerated access to critical mitigation and adaptation technologies”.<sup>2</sup>

Study Question 198 has been established in order to create within AIPPI the collective intelligence capable of evaluating in an objective and expert manner the complex and politicized debate about IP and technology transfer in the green technology context, in particular within the framework of the UNFCCC. It is believed that AIPPI can shed light on the ongoing debate and reduce misunderstandings of the IP system, its underlying architecture, laws and practical implementation.

At present, there seems to be some debate on what the term “green technology” covers. On the one hand, Chapter 24 of Agenda 21 under the UNFCCC refers to Environmentally Sound Technologies (ESTs), which are intended to encompass the following technologies:

- technologies protecting the environment,
- less polluting technologies,
- technologies using resources in a more sustainable manner,
- technologies aiming at recycling of waste and products, and
- technologies handling residual wastes, e. g. by purification processes.

On the other hand, the Intergovernmental Panel for Climate Change (IPCC) makes a classification between “Climate Change Mitigation Technology” and “Climate Change Adaptation Technology”, the former covering technological change and substitution that reduce energy resource inputs and emissions, while the latter cover technologies intended to reduce the harmful effects arising from expected climate change.

While there is no commonly accepted definition of the term “green technology”, one may also consider the term “green inventions” which is understood to refer to environmentally friendly inventions that often involve energy efficiency, alternatives to fossil fuel and carbon generation, pollution and toxic remediation, water purification, recycling, safety and health concerns, renewable resources, etc.<sup>3</sup>

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<sup>1</sup> Hereinafter referred to as the “Committee”

<sup>2</sup> E. g., Agenda for COP-17, 2011, Durban, South Africa.

<sup>3</sup> See, e. g., [http://inventors.about.com/od/greeninventions/p/green\\_invention.htm](http://inventors.about.com/od/greeninventions/p/green_invention.htm).

The present Report does not deal with the question of whether mitigation technology or adaptation technology is more important. Accordingly, the present Report does not enter into a debate on what could appropriately be considered as "green invention" or "green technology". Instead, for the purpose of this Report and the work of the Committee in general, the generic term "green technology" will be used. This term is understood as comprising all forms of environmentally sound technologies, climate change mitigation technologies as well as climate change adaptation technologies.

The Committee members have addressed the relationship of the IP system to the exigent issue of climate change mitigation and adaptation. The challenge we face as IP professionals, at this stage when climate change is a critically important topic, is to demonstrate in a credible fashion that IP can promote (not hinder) the development, commercialization and distribution of technologies for climate change mitigation and adaptation. Our success in so doing will depend upon our capacity to explore the criticisms of IP in an objective and open manner, to abandon rote defenses of IP that have been advanced in the past, and to contribute our expert understanding of how IP works in practice.

In particular, we must address the role of IP in access to green technologies by developing countries.<sup>4</sup> Does the IP system hinder or help parties in developing countries to use and develop green technologies?

Developing countries have repeatedly questioned the relationship of the IP system to technology transfer. In the context of climate change technologies, this discussion has insisted that the IP system, in particular patents, must serve as tool for transferring critical technologies that will help developing countries mitigate and adapt to climate change realities such as rising water levels, desertification, water shortages, extreme weather, and ocean acidification.

This Report begins in Part I by examining the IP system at its most broad level, its "architecture", by which we mean the set of assumptions, laws, regulations and practices underlying intellectual property as a tool for promoting innovation. Part I considers that the purpose of the IP system is to promote innovation and creativity. The IP system is premised on the ideas of fundamental fairness, win-win transactions and the value of human capital. In technology fields, IP ownership is the key element that makes it possible for inventors to commercialize new technologies because it permits investment in intangible assets. IP is also essential to technology transfer because it permits the exchange and sharing of intangible assets. The problem of access of developing countries to climate change technologies, however, is exacerbated by the reality of the "IP Divide". Although this reality is changing, with emerging economies becoming more active in using the IP system, the current architecture of global IP rests on a risky fault line, with the vast majority of patents worldwide owned by nationals of fewer than 10 nations. Technology transfer can, at least in the medium-to-long run, mitigate the IP Divide and contribute to a shift in the current paradigm. Successful technology transfer requires, among the other things, balanced negotiations

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<sup>4</sup> In this Report, generally we refer to developing countries and least developed countries (LDCs) under the common term "developing countries".

between parties in the technology market. Part I considers how the credibility of arguments about the IP system and access to climate change technologies depends on broadening and strengthening the foundation for the IP system.

Part II of the Report evaluates proposals for changes to the laws of intellectual property. Should they be changed to promote inventions and dissemination of green technologies? Would extending the patent term provide greater incentives for climate change technology development, or rather create obstacles to dissemination of such technologies? Would laws designed to accelerate the grant or refusal of patent applications for climate change technologies be effective stimulants for technology development and commercialization? These are some of the questions discussed in Part II. The debate over the extended utilization of compulsory licensing is also addressed in this section, concluding that while compulsory licensing is a last resort legal tool that is already available in the patent legislation of most countries, it may not be an efficient means for technology transfer. In essence, this Part II of the Report addresses arguments relating to whether the law of IP blocks / hinders technology transfer. It also assesses proposals for tweaking IP laws so as to incentivize and manage climate change technology inventions in a more expeditious manner.

Part III of the Report examines the practical implementation of IP laws as they affect climate change technologies, including topics such as IP licensing, development collaboration, patents as a tool for disseminating technical information, technology transfer and IP asset development in developing and emerging economies. At the level of implementation, the Report details specific initiatives that have been undertaken to demonstrate that the IP system and laws can be implemented in such a way as to promote the development, commercialization and distribution of climate change technologies. In this context, the work of the European Patent Office (EPO) on patent information as a way to increase the transparency of the patent system is addressed in some detail. WIPO's work to promote IP asset development and licensing training in developing countries, so as to increase ownership of IP by developing country parties is also addressed. Structured efforts to encourage technology transfer such as the Japan Intellectual Property Association's Green Technology Package Program (GTPP), which later became WIPO's "WIPO GREEN" program, are also addressed. Part III finally addresses pooling proposals and other "mechanisms"<sup>5</sup> that have been advanced as means of facilitating technology transfer in climate change technologies.

The conclusion of this Report is that fundamental changes in IP architecture and laws are not needed in order to support the development, commercialization and use of climate change technologies. However, that does not mean that we can comfortably rely on the *status quo* at a time when the IP system is criticized as erecting barriers to climate change technology. Instead, a more creative and vigorous implementation of the IP system is warranted, including: IP asset development and strengthened innovation ecosystems in developing countries, promotion of IP licensing and research and development collaboration as a means to facilitate technology transfer, and use of patent information to facilitate technology collaboration and commercialization .

In addressing IP and its relationship to technology transfer, it must be taken into account that different types of technologies are at play in the environmental and climate change context.

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<sup>5</sup> In particular the UNFCCC Technology Mechanism.

There are highly complex technologies which require technological experience and strong engineering capacity.<sup>6</sup> On the other hand, there are technologies that can easily be applied and produced practically anywhere.<sup>7</sup> Between these two extremes there is a broad middle ground covering activities ranging from basic and applied R&D, creation of derivative works and improvements, localization, manufacturing, local assembly and mounting of imported product components, to after sales service and support.<sup>8</sup>

The technical complexity of the problems to be solved in the climate change context require collaborations, on a global scale, more than ever. We should not focus our expectations on fundamental “single” breakthrough inventions by individual inventors. Inventions today, in most cases, are the result of collaborative efforts and incremental advances. To the extent that the IP system can be more inclusive, bringing together inventors, creators and businesspersons from many nations, IP can be a more effective tool in meeting the challenge of climate change. Networks can also make it easier for inventors and creators in developing countries to gain access to national and international IP service providers who can help them make assets out of their intellectual capital.<sup>9</sup>

In this Report, we do not deal in detail with the aspect of cost covering/financing of the measures proposed. It is, however essential that the necessary funding be made available especially for parties in developing countries that in many cases simply do not have the necessary funds. International institutions, as well as the governments and societies must make contributions in appropriate and innovative ways.

The success of IP as a strategic tool for economic development is premised on the engagement, participation and contribution of indigenous intellectual capital. Funding mechanisms under the UNFCCC that promote active engagement by developing country parties in the research, development and commercialization of green technologies, can help spread green technology and create economic spill-over effects in the developing country (jobs, new industries, service industry development, etc.). To the extent possible, funding mechanisms should promote active green technology R&D initiatives and collaborations among scientists and technologies in developing and industrialized countries alike. The IP system is critical in the process because it permits developing country parties to claim ownership interests in green technologies based on their R&D contributions.

Please note in particular the Overall Conclusions and Suggestions at the end of this Report.

A disclaimer is apt at this stage, before proceeding to the Report. While the Report mentions IP in general, one may observe that for the most part, it addresses the patent system in

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<sup>6</sup> For example, for large installations/plants, such as hydropower plants, concentrated solar power (CSP) plants, etc.

<sup>7</sup> This is the case for many end-user products, such as solar lamps, solar cooking devices, etc.

<sup>8</sup> Example : photovoltaic (PV) installations where PV modules are imported while assembly together with locally produced components and mounting are done locally, thus creating jobs and enhancing expertise.

<sup>9</sup> See R&D Networks and Intellectual Property, A Model for Supporting Developing Country Researchers in Creating, Owning and Exploiting Research Results, <http://www.ruig-gian.org/research/projects/projecta856.html?ID=24> .

particular. It is the patent system that has been criticized the most in the context of climate change and technology transfer and therefore, the Committee believes that addressing especially these concerns would be most appropriate.

**Part I**  
**Level of Architecture**

**I. Issues Presented**

What do the challenges posed by climate change mean for the fundamental design, the “architecture”, of the IP system? Is the architecture so perfect a tool for advancing new technologies that it requires no change, but rather strict adherence to the *status quo*?

Or is it a legal/economic system that is basically sound and dynamic in nature, but needful of amendment and/or better utilization?

Or, as some critics suggest, is the IP system so fundamentally flawed that it should be completely abandoned, or at least abandoned in the exceptional context of climate change mitigation and adaptation technologies?

**I.1 IP is only one element in a larger innovation ecosystem**

In understanding the relationship of IP to any new technology, it is important to recognize that IP is only one element in a larger innovation ecosystem. IP laws alone do not, at least not sufficiently, promote technology development. IP is part of a larger innovation framework. If one were to visualize this framework as a physical structure, the foundation of the structure is investment in education and research and development. Other structural pillars include access to capital (private investment, government funding, venture capital), professional services (lawyers, patent attorneys and patents agents, technology managers, businesspersons with management and financial expertise), IP laws and enforcement, laws and policies in research institutions that promote technology management, licensing, branding, marketing and distribution. If there is deficiency in any one of these pillars, the innovation structure will be deficient. After all, a system is only as good or as strong as its weakest link.

The UNFCCC has recognized the importance of “climate friendly national systems of innovation (NSI)”: “The elaboration of climate friendly NSI would be helpful to strengthen the understanding on how to systematically promote innovation to address climate change, in particular at national level, with a view to promoting endogenous development of technologies in developing countries and countries with economies in transition to address climate change.”<sup>10</sup>

**I.2 Innovation ecosystems require an IP system**

IP laws alone cannot support innovation infrastructure; on the other hand, an innovation framework without a vigorous IP system is likely to collapse. This is true for several reasons,

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<sup>10</sup> EGTT/2010/15, A background paper on consideration of options for encouraging the setting up or strengthening of institutions such as national systems of innovation.

the most important of which are: (1) technology development and commercialization require investment in intangible assets and, if any competitor can use the intangible asset without investment, no investor will be willing to risk capital; (2) technology commercialization depends on collaboration among multiple unrelated parties. In order to negotiate technology licensing and collaboration agreements, the parties must know who owns what in order to define and value their shares in the transaction. Moreover, the presence of effective IP protection builds confidence in innovators that technology can be shared without too much worry about potential abuse; and (3) IP empowers research institutions and small ventures that are poor in financial capital, real and personal property, but rich in human capital and invention. Such institutions / ventures may not possess the wherewithal to commercialize and make available their inventions. Without IP protection these intellectual asset-rich entities may not be enabled to commercialize through others and in such instances, without IP protection, these entities would have limited bargaining power relative to companies with financial capital and tangible assets.

Technology licensing and development collaboration are critical for the emergence and distribution of technologies that can mitigate climate change, particularly when the technologies are highly complex.<sup>11</sup> The opportunity for productive international collaboration increases when developing country human capital participates fully. Needless to say, true collaboration thrives when there is a more or less level playing field where all parties contribute assets to the collaboration, and where intangible assets like human capital receive appropriate and equitable valuation. Without intellectual property, this is difficult to achieve because intangible assets cannot be claimed, protected and traded. The so-called “IP divide” is exacerbated by the minimal use of the IP system to protect technological advances achieved in the developing countries – often in public universities and research institutions – with the result that such advances lose their potential value as intangible assets. International collaboration in research and development in green technology will be more fruitful as developing country parties join collaborations as contributors of intellectual capital and owners of IP assets.

### **I.3 IP and technology transfer**

Technology transfer is part of the architecture of the IP system.

In order to understand the relationship of IP to technology transfer, it is essential to appreciate that technology cannot be sold in the same way as a technology product can be sold. Selling a sophisticated telephone to a person is not the same as enabling the person to manufacture the telephone and invent improvements to it. The famous aphorism applies: "Give a man a fish, and you have fed him once. Teach him *how* to fish and you have fed him for a lifetime." The aim of climate change technology transfer to developing countries is empowerment: helping developing country parties to participate in the manufacture, use, development, improvement,

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<sup>11</sup> Inter alia, please refer to World Intellectual Property Report (2011), page 29: Increasingly, multinational enterprises (MNEs) source input and technology from suppliers worldwide. This reflects a fragmentation of the production process in the manufacturing and services industries, with increases in task-based manufacturing, intermediate trade and outsourcing of services. As a result, a greater number of countries participate in global production and innovation networks. Innovation networks have created a potential for technological and organizational learning by manufacturers and exporters, leading to industrial upgrading.

commercialization and distribution of green technologies. In addition, international green technology collaboration will create a market for the sale of technology products from industrialized countries to new markets in developing countries.

Transfer of technology can function when both parties to an agreement benefit from an adequate innovation ecosystem. The elements of such a system include:

- Adequate public and private funding for primary, secondary and tertiary education and research and development;
- Incentives for technology development, management and commercialization;
- Laws or policies clarifying IP ownership and inventor compensation in public universities and other publicly funded research institutions so as to permit licensing and commercialization;
- Transparent systems of technology information for entrepreneurs (potential licensees and developers) to know which technologies exist and are available, and how these technologies may be compared;
- A functional, efficient and affordable IP system including registration (especially for patents and trademarks) and enforcement; at least in the medium or long run, substantive examination of patents should be part of the patent granting process to ensure optimum patent quality;
- Trained professionals, including lawyers, patent attorneys, patent agents, patent drafters, licensing professionals, who provide IP-related services;
- Links between universities and other research institutions and the private sector so as to permit commercialization of IP-protected research results in products that enter the market and that address public needs;
- An entrepreneur friendly business environment that protects investors and eliminates unnecessary delays in required administrative approvals and other government processes affecting the conduct of business.

Many developing countries have research and development capacity in universities and other research institutes, many of which perform R&D in the field of climate change technology as well as other technical fields. However, these institutions often fail to use the IP systems that exist in their own countries to claim ownership of their inventions and to harvest the economic value of such inventions. To a certain extent, this is changing as countries like China, Brazil, Colombia, Turkey, and Malaysia, to mention only a few, have begun to develop innovation ecosystems that include indigenous use of the IP system, though with substantial differences among the mentioned countries both in absolute figures as well as in the speed of growth. The architecture of the IP system depends on continued expansion and growth of innovation ecosystems that promote use of the IP system by citizen owners - scientists and business ventures - in developing countries. This is as true in relation to green technology development as it is in other fields of technology.

It should not be forgotten that an inclusive IP architecture is in the vital interest of industrialized countries, too. Investing in education and IP/innovation infrastructure in developing countries means investing in the future viability of the IP system worldwide. Market expansion and technology collaboration in climate change mitigation technologies will benefit all concerned and increase the prospect for global success in the struggle to overcome the negative effects of climate change.

## **I.4 Patent information**

Patent information is part of the IP architecture. The patent system is premised on the public availability of technological information in the form of patent claims, drawings and specifications. There is a social contract between the inventor and society, granting temporary exclusive rights for an invention, in exchange for disclosure of the invention, and how to carry it out. This encourages investment in research and development, while minimizing reinvention and duplication through timely publication into the public domain. There is a need to engage in an informed debate on issues pertaining to the use of patents in the green technology field. Combating climate change and promoting climate change technologies are a core challenge for mankind. As discussed further in Part III, the European Patent Office (EPO) has taken concrete steps to improve the use of the patent system for society at large by: (1) facilitating access to patents by way of a dedicated classification scheme for clean energy technology (CET) and other climate change mitigation technology (CCMT) patents, and (2) by authoring reports analyzing the patents and technology situation in given areas. The aim is to promote transparency in information on green technologies. This effort by the EPO is an integral part of the Cooperative Patent Classification (CPC) system jointly established by the USPTO and EPO.<sup>12</sup>

### **Part I Conclusion**

The architecture of the IP system is sound and dynamic in nature. It is based on a foundation of public and private investment in education, research and development. It is dependant on the enforcement of IP laws, the presence of an otherwise robust innovation infrastructure that enables technology transfer and collaboration, and publicly available information on patents.

No inherent deficiencies have been identified concerning the architecture of the presently existing IP system as it affects green technology. Climate change related discussions have not provided any ground for changing the fundamental architecture of the IP system.

Issues relating to IP laws and their implementation, particularly in the context of climate change, are discussed in the following Part II and Part III.

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<sup>12</sup> CPC entered into force in January 2013.

## **Part II Level of Law**

### **II. Issues Presented**

As discussed in Part I, the architecture of the IP system creates an incentive for inventions, technical creativity, innovation and transfer of green technology, rather than acting as a deterrent in the area. This Part II analyses changes to IP laws that have been proposed in order to advance green innovation and technology transfer.

For example, this part assesses whether the conditions for granting patents could be amended to accelerate the deployment of green technologies, particularly in developing countries. There are several ways by which patent laws could be modified to address climate change. Some are more drastic than others. And some have an impact on substantive law while others have an impact on procedural aspects.

#### **II.1 Modifications to accelerate the patent granting process**

The duration of the process of patent granting at various patent offices is a major issue. Sometimes patent applicants have no interest in accelerating the granting process, e.g. because claims still can be modified during the granting process, payment of office fees may be deferred or applicants can test their products on the market, etc. In other cases patent applicants may find it convenient to obtain an accelerated granting process, e.g. in the case of a start-up company, because it will be easier to find investors, to grant licenses or to sue infringers. For competitors of the patent applicant, generally, a quick granting process is preferable, in order to know the validity and the exact scope of the monopoly right conferred by the patent. The general public has an interest in keeping the transaction costs generated by the patent system as low as possible. There is also a public perception that the patent process is too protracted and costly to use, and this perception may undermine use of the system.

Regarding the granting process of patents in the green technology field, several measures have been taken to accelerate the examination and the grant of patent applications relating to green technology, including expedited search and examination of patent applications for green technologies.

The United Kingdom Intellectual Property Office (UKIPO) was the first office to introduce an accelerated procedure for green technologies in May 2009 by establishing the “Green Channel” initiative. Several other countries developed similar programs: the Korean Intellectual Property Office (KIPO), the United States Patent and Trademark Office (USPTO)<sup>13</sup>, the Canadian Intellectual Property Office (CIPO), the Australian Intellectual Property Office (IP Australia), the Japanese Patent Office (JPO), the Israel Patent Office, the Brazil Patent Office (INPI) and the Chinese Patent Office (SIPO)<sup>14</sup>. One difficulty raised in this context is the definition of “green inventions” that may benefit from these accelerated

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<sup>13</sup> USPTO closed this program in February 2012, at the date that the 3,500th application for which a petition is granted was in condition for examination.

procedures. Most of the patent offices use a broad and imprecise definition and merely require the applicant to declare the ecological benefit of the invention.

The European Patent Office (EPO) offers a comparable acceleration scheme for patent applications in any technical field. Applicants can opt for accelerated processing of the search (search report) and/or the examination free-of-charge.<sup>15</sup>

A significant number of IP Offices offer “deferred examination”, in that the request for the search and examination of a patent application may be delayed up to 3 (JPO, SIPO), 5 (KIPO, CIPO) or even 7 years (GPTO<sup>16</sup>) after the filing date. This possibility applies equally to patent applications for climate change technologies. Such a practice potentially reduces the workload for patent offices, allowing them to concentrate on those patent applications considered by patent applicants to be most important, but increases the uncertainty for the market in general.

The Committee is sympathetic to programs accelerating search, examination and issue of patents relating to technologies in the green technology field. Such accelerated proceedings clarify the patentability and scope of protection of such inventions. This benefits inventors/patent applicants as well as their competitors and the general public.

## II.2 Modifying the patentability conditions

Some analysts have proposed redefining the patentability criteria for inventions in the field of green technologies in order to facilitate patent protection and thereby increase commercialization potential.<sup>17</sup> The suggestion relates to lowering the threshold for inventive steps so that patents could be granted on obvious or known technologies having the potential to reduce greenhouse gas emissions. The idea is to give such inventions based on known technologies patent protection so that they can be applied as technical solutions to protect the environment.

One of the big challenges for all patent offices across the world is to maintain high quality in patent grants and discourage grants of low quality patents. As an example, only approximately 50% of patent applications are granted at the EPO, and the scope of protection of those granted is often reduced during the examination process.

High quality patents offering maximum legal security, and protecting the interests of both inventors and the public, are the cornerstone of a properly functioning patent system. They provide the optimum balance between private and public interests, disseminating technical information widely, while limiting granted exclusive rights to valid inventions. High quality patents are likely to withstand invalidity proceedings in court or opposition/re-examination procedures, and – at least in many cases - also enable the skilled person to put the invention into practice without further experimentation. Licensing of high quality patents is easier

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<sup>14</sup> See: A. Dechezleprêtre, *Fast-tracking Green Patent Applications. An Empirical Analysis*, ICTSD report, February 2013

<sup>15</sup> For a comparison of such procedures with other green acceleration programs, see: A. Dechezleprêtre, *Fast-tracking Green Patent Applications. An Empirical Analysis*, ICTSD report, February 2013.

<sup>16</sup> German Patent and Trademark Office.

<sup>17</sup> K. Luzzato, Patents can help the environment, *IP World*, September 2008, p. 6-9.

because their validity is strong; as a result, technology is more widely disseminated counterbalancing the grant of exclusive rights. On a global level, this may be supported by high quality PCT ISA and IPEA<sup>18</sup> search and examination, and global sharing of search and examination results using for example the IP5 Offices’<sup>19</sup> Common Citation Document.

A proliferation of “utility models”, or patent applications which do not receive a substantive examination for the requirements of novelty or inventive step, might prove a risk should significant numbers be filed in the green technology fields.

The proposal would be inconsistent with fundamental principles of patent law. It would risk multiplying patent applications on relatively obvious adaptations of products or processes for “green” purposes. Such a modification might even allow the grant of exclusivity on trivial changes. It would also unnecessarily increase transaction costs and create barriers for new technology entrants in both industrialized and developing countries. Not only will it increase the risks / uncertainties for various players to operate in the area, it will also result in significant transaction costs during deployment of a given technology. It would further likely increase costs of technology products that are based on only low levels of originality and inventive step. In addition, patent office examiners would hardly have clear criteria for grant or rejection of patent applications. Serious doubts exist therefore as to the utility of such a measure. Propositions aimed at diluting the conditions of patentability specifically for inventions considered environmentally sound do not appear to be an appropriate solution. Further, the definition of which patent applications would benefit from special “easy” treatment for the category of "green patent" would be unclear.

Therefore, the Committee does not support the proposal to redefine the patentability criteria for inventions in the field of green technologies.

### **II.3 Extending (or reducing) the patent term of green technology inventions**

This proposal would extend the patent term for inventions in the green technology field, the rationale being that such additional protection would create a strong incentive for inventors and businesses commercializing green technology inventions. One option would be to allow an additional patent certificate (SPC - supplementary protection certificate)<sup>20</sup> at the end of the normal patent term if it can be shown that the patent monopoly confers significant environmental benefits or if the patentee accepts to grant licenses to third parties.

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<sup>18</sup> Patent Cooperation Treaty - International Search Authority and International Preliminary Examination Authority.

<sup>19</sup> The Five IP Offices, a forum of the five largest intellectual property offices in the world that is being set up to improve the efficiency of the examination process for patents worldwide. The members of IP5 are: the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People’s Republic of China (SIPO), and the United States Patent and Trademark Office (USPTO).

Today, the IP5 Offices account for 90% of all patent applications filed worldwide and for 93% of all work carried out under the Patent Cooperation Treaty (PCT).

<sup>20</sup> Similar to what is common in certain jurisdictions for patents in the pharmaceutical field.

The Committee considers that such an extension, to a large extent, would probably not become practically relevant since the 20 year period has proven to be a best reasonable compromise over a long period of time. Generally, the domain of green technology is very wide; some patents will be obsolete more quickly than others, depending on the specific technical field. Furthermore, an extended protection term could hinder unlimited commercial dissemination. On the other hand, reduction of the patent term proposed as a way to make green technology enter into the public domain more quickly, could have a deterrent effect on investment in research and development in this field.

Therefore, the Committee does not support the proposal to extend or reduce the patent term for inventions in the field of green technologies.

#### **II.4 Excluding “polluting” inventions from patentability**

A proposal was made to supplement the patenting criteria by an eco-friendly condition along with the customary novelty, inventive step and industrial application prerequisites. Consequently, polluting inventions would not be patentable.<sup>21</sup>

The Committee does not support such exclusion. Patent examiners are skilled in determining prior art, obviousness and other legal questions. They do not have the responsibility, competence or adequate time to assess scientific questions relating to the environmental effect of an invention. Moreover, inventions are complex and multi-faceted. For instance, many inventions allow “dual use”, i.e. they can be exploited both in an environmentally friendly way and in a way that might be damaging the environment. Completely excluding such inventions may be over-exclusive.

The patent system does not have a regulatory/political function (beyond the existing limits regarding, e.g., *ordre public* and morality). Regulatory activities regarding the use of certain technologies remain the responsibility and competence of governments and/or international conventions.

Therefore, the Committee does not support the proposal to exclude allegedly "polluting" inventions from patentability.

#### **II.5 Dissemination of green technology and compulsory licenses**

The challenge faced in the green technology area is to encourage innovation in this field while at the same time promoting the diffusion and the transfer of these technologies to third parties on a worldwide scale.

The Committee considers that patent law *per se* is not a barrier to technology transfer. This is empirically proven by the fact that, as of today, inventions in the green technology field are rarely patented in developing countries, particularly in least developed countries. For instance, less than 1% of patent applications relating to clean energy technologies filed 1980 - 2009 were filed in the countries of the African continent. Of these, some 85% were filed in South

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<sup>21</sup> E. Derclaye, Intellectual Property Rights and Global Warming, *Marquette Intellectual Property Law Review*, 2008, p. 263.

Africa, so that the number of green technology patents filed in the remaining African countries is negligible.<sup>22</sup> Therefore, the argument that existence of patents causes hindrance to technology transfer does not appear to have a factual foundation. Furthermore, even when inventions are patented in these countries, a patent license on its own is not a sufficient basis for the efficient transfer of a technology because, in most cases, in addition to patents, associated know-how/trade secrets, copyrights, etc. are necessary for its implementation.

The most effective tool for green technology transfer to developing countries is the grant of a package (hybrid) technology license that confers rights to practice patents (if inventions are in fact patented in the relevant country) and know-how/trade secrets as well as software and copyright works, combined with a contractual commitment for training and, in some cases, collaborative research and development. However, in practice, licensing is not sufficiently used in the domain of green technology for a number of reasons: limited experience and expertise both in the technical field and in the patent/licensing field, weak infrastructure, lack of knowledge regarding patent law, etc. in the recipient country, inadequate capital and/or financial support, dearth of suitably skilled staff, scientific infrastructure, and favorable market conditions.

In this context, some analysts have proposed enacting special compulsory licensing laws and regulations in the green technology domain to supplement existing national laws on compulsory licensing. The Committee does not support such additional regulations for several reasons. First, compulsory licensing laws and regulations already exist in most jurisdictions in both developing and industrialized countries. Second, the Committee is convinced that voluntary licensing can be an adequate tool for transfer of green technologies, in particular to developing countries.

Provisions relating to compulsory licenses are stated in the Paris Convention, TRIPS and national legislations.

**The Paris Convention:** Article 5.A of the Paris Convention provides rules regarding compulsory licenses relating to patents and utility models. Article 5.A (2) recognizes the right of each Member State to take legislative measures providing for the grant of compulsory licenses to prevent abuses which might result from the exercise of the exclusive rights conferred by the patent, for example, failure to work the patent. Article 5.A (4) clarifies that a compulsory license may not be granted on the ground of failure to work or insufficient working before the expiration of a period of four years from the filing date or three years from the date of the grant of the patent. The compulsory license shall be non-exclusive and shall not be transferable.

**TRIPS Agreement:** Articles 30 and 31 of the TRIPS Agreement provide some exceptions and limitations to the exclusive rights that WTO Members may provide in their national laws. Article 30 allows Members to provide limited exceptions to the exclusive rights conferred by a patent, provided that such exceptions do not unreasonably conflict with a normal exploitation of the patent and do not unreasonably prejudice the legitimate interests of the patent owner, taking equally into account the legitimate interests of third parties.

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<sup>22</sup> United Nations Environment Programme (UNEP)/European Patent Office (EPO) study *Patents and clean energy technologies in Africa*, 2013, [www.epo.org/clean-energy-africa](http://www.epo.org/clean-energy-africa)

Article 31 provides that a Member may allow uses other than that those allowed under Article 30, without authorization of the rights holder. Typically, this would cover compulsory licenses in favor of third parties and for government use without the authorization of the right holder. Such use may only be permitted if, prior to such use, the proposed user has made efforts to obtain authorization from the right holder on reasonable commercial terms and conditions and that such efforts have not been successful within a reasonable period of time. This requirement may be waived by a Member in the case of a national emergency or other circumstance of extreme urgency or in cases of public non-commercial use. With respect to the grant of compulsory licenses and what constitutes a “national emergency or other circumstances of extreme urgency”, the Declaration on the TRIPS Agreement and Public Health, adopted by the Fourth Session of the WTO Ministerial Conference at Doha on November 14, 2001, provides some guidance for the interpretation and application of Article 31.

**National legislations:** A large number of industrialized and developing countries have legislation that allows the government and/or third parties to use a patented invention without the authorization of the right holder under certain specific circumstances and conditions.

Compulsory licenses are granted against consideration and not for free. As with voluntary licensing, compulsory licensing requires a period of negotiation before the right can be exercised and compensation must be paid. As a practical matter, compulsory licensing has limited utility and is seldom invoked because it only permits practice of the patent, and does not entail know how transfer or collaboration, both of which are important for successful technology transfer. While there are rules for compulsory licensing of patents, it appears impossible to force technology owners to disclose and transfer their complete and detailed know-how/trade secrets, software and technical documentation.

The Committee considers that there is no need to change the current laws relating to compulsory licenses because existing laws are adequate for emergency situations. Voluntary licensing is a far superior means of technology transfer. Further, any modification of international rules and regulations on compulsory licensing for green technology could have a deterrent effect on research and development investment and innovation in the green technology field, while having a minimal positive effect on the availability of such technology. Creating special rules of compulsory licenses for green technology, may, in fact, cause a reflexive reaction from the industry side to bury more inventions into the domain of proprietary technology and trade secrets.

## **Part II Conclusion**

The Committee considers that the existing substantive patent law is well equipped to support and accelerate green technology innovation and dissemination. The Committee supports changes to IP laws that aim at accelerating the grant of green technology patents and promoting the voluntary dissemination of technology through IP licensing, collaborative development or other means.

The Committee, however, does not support proposals for fundamental changes in substantive patent law such as the modification of patentability conditions, extending the patent term of green inventions, excluding “polluting” inventions from patentable subject matter, and special green technology compulsory licensing laws.

<p><b>Part III</b> <b>Level of Implementation</b></p>
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### **III. Issues presented**

The aim of this Part III is to identify practical IP-related approaches to accelerate the development and dissemination of green technologies. This aspect is of fundamental importance because eventually practical results must be achieved - the proof of the pudding is in the eating. This Part examines two ways in which IP accelerates the development and dissemination of technology: (1) access to technical knowledge in the form of patent information and (2) agreements for licensing and collaborative projects. In connection with the latter, this Part examines various programs that have been proposed and implemented to promote licensing and collaboration agreements between industrialized and developing country parties in green technology fields.

#### **III.1 Access to technical information**

Apart from encouraging innovation by enabling inventors to exploit their inventions through exclusive rights, the global patent system supports innovation through the dissemination of technical knowledge, allowing further research and development initiatives to build upon existing technical knowledge. Today, patent information is readily available globally, free of charge, via the Internet. IP offices of individual nations publish copies of patent applications and issued patents. The World Intellectual Property Organization (WIPO) publishes a database of patents called *PATENTSCOPE* that provides access to international Patent Cooperation Treaty (PCT) applications in full text format on the day of publication. The *PATENTSCOPE* database may be searched by entering keywords, names of applicants, international patent classification and other search criteria in multiple languages.

The EPO's *Espacenet* patent information service makes about 88 million patent documents available. This is further supplemented by patent family information, legal status information, citations including references to non-patent literature, and links to the European Patent Register for European and Euro-PCT documents and to selected national patent registers, which improves the access to legal status data. Multilingual access to the documents available on *Espacenet* is provided by the EPO's *PatentTranslate*. At the end of 2014 *PatentTranslate* is expected to cover all 28 languages of the EPO's 38 member states, plus Chinese, Japanese, Korean and Russian, as well as from and into French and German for 17 of the European languages. The EPO's worldwide legal status database *INPADOC* also aims to enable wider availability of legal status data from different IP Offices.

Although considerable collections of Patent Information literature are already available online, those from many smaller IP Offices are still to be made available. In addition, much legal status data is not yet available online. This is important as, once relevant patent applications and specifications have been retrieved, it is important to know in which countries family members have been filed, and their legal status (active, granted, no longer active, refused etc.). A 2010 study made by UNEP, EPO, and the International Centre for Trade and Sustainable

Development (ICTSD) showed that there is a need for a better implementation of the information aspects of the patent system.<sup>23</sup>

In the green technology domain, the EPO has developed a patent search functionality to serve a broader user constituency (not only patent attorneys, but also technology analysts, university researchers, technology negotiators, and industry in general). This database uses a dedicated classification scheme (Y02, Y04) developed in close collaboration with experts, using technological guidelines produced by the UNFCCC and the Intergovernmental Panel on Climate Change (IPCC), creating greater transparency for, and access to, patent information in this area. The Y02/04 classification enables both access to patent information for clean technology, as well as allowing strategists and decision makers to better landscape clean technology. The Y02/04 classification scheme tags and indexes 1.5 million documents relevant to climate change related technologies. This specialized scheme is included in the new Cooperative Patent Classification (CPC). The scheme now includes five sections, namely Y02B for CCMTs in buildings, including the residential sector, Y02C for greenhouse gases capture and storage, Y02E for CCMTs in energy generation, transmission and distribution, Y02T for CCMTs in the transportation of goods and persons, and Y04S for the new cross-platform technology generally termed as "Smart Grids". Although relating to the generation, transmission and distribution of energy, Smart Grids incorporate new developments in many other technical fields, including computing and telecommunications, to optimize the management of energy generation and use in a modern, clean energy world. One of the most significant advantages of this new classification schemes is the clarity provided to external organizations searching for existing green technology patents.<sup>24</sup> Engineers, scientists, institutions and decision makers can gain factual information to construct or modify future climate-change related policies and make high-level decisions. This allows researchers to benefit from the technical state of the art in any field, but also indicates potential technology partners through identifying inventors and IP owners.

The statistical data provided by the Y02 / Y04S classification scheme in combination with statistical analysis tools such as EPO's *PATSTAT* also provide evidence and trend analysis relevant to climate change policies.

For instance, a report published in 2013 by the EPO and UNEP on "Patents and clean energy technologies in Africa" showed that, while Africa has a huge untapped potential for generating clean energy, less than 1% of associated patent applications have been filed in Africa.<sup>25</sup> Patent rights are therefore unlikely to be a significant consideration in any decision to exploit these technologies in African counties although as African economies are growing rapidly, this may change. In the meantime, the current low level of patent filing in African jurisdictions means that parties may make, use and sell many green technologies in African

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<sup>23</sup> See: Patents and clean energy: bridging the gap between evidence and policy, [www.unep.ch/etb/events/UNEP%20EPO%20ICTSD%20Event%2030%20Sept%202010%20Brussels/Study%20Patents%20and%20clean%20energy\\_15.9.10.pdf](http://www.unep.ch/etb/events/UNEP%20EPO%20ICTSD%20Event%2030%20Sept%202010%20Brussels/Study%20Patents%20and%20clean%20energy_15.9.10.pdf)

<sup>24</sup> The EPO uses the terminology clean energy technology (CET), meaning energy generation with low greenhouse gas emissions; and climate change mitigation technology (CCMT) to include also the areas relating to Buildings, Transport and Smart Grids.

<sup>25</sup> See: Patents and clean energy in Africa, <http://www.unep.org/newscentre/default.aspx?DocumentID=2716&ArticleID=9502&l=en>

countries legally and without fear of infringement. Such unprotected invention opportunities may be identified by searching patent databases.

As was mentioned earlier, under any circumstance, the patent system is a *conditio sine qua non* to support technology transfer since without patents to protect their products and processes, the source companies may be reluctant to engage in technology transfer and associated investments. When combined with better patent information databases and search tools, technology transfer will only be better enabled. Nonetheless, despite the growing sophistication of patent information databases, the availability of patent information and patent licenses alone in most cases will not solve the problem of access to green technology for developing countries for at least these reasons:

1. The text of patents normally is not a complete description of the underlying technology. Patent claims are legal formulations related to specific inventions, they cannot replace detailed technical documentation;
2. Know-how, trade secrets and technical works of authorship (documentation and software) also play a major role in the transfer of technology;
3. Other significant factors affect the ability of many developing country parties to use patent information as a tool for technology transfer, including lack of . suitably skilled staff, scientific infrastructure, innovation infrastructure, institutional policies and laws clarifying the right to exploit technology; and
4. Lack of financing and favorable market conditions.

This is the reason why public and private programs should focus on complete technology packages.

Despite the afore-mentioned limitations, patent information will remain a useful tool for technology transfer in green technology for the following reasons:

1. Study and learn from technical information in patent claims (*training benefit*);
2. “Leapfrog” over issued patents by inventing improvements that avoid or build on the claims (*leapfrog benefit*);
3. Analyze claims and other information contained in the patent document to strategize about potential collaborations, markets and research direction (*business strategy benefit*);
4. Patent landscaping and other analysis for public policy (*innovation strategy benefit*); and
5. If the patents are not filed where the party will make, use or sell products practicing the invention, practice inventions legally (*unprotected patent exploitation benefit*).

The development of standards in the green technology domain may also be quite relevant. Standardization may support the incorporation of new technologies into a supply chain, ensuring interoperability with other essential components, thereby further supporting the sustainability of the production and consumption system. Standards can also support waste disposal and recycling, e. g. by ensuring that products are manufactured in a way that safeguards their final recyclability. They can be considered as indirect policy instruments to guide industry towards more environmental friendliness, social responsibility and economic efficiency. Standards are becoming important as related technology fields , such as energy, transport and buildings are merging with Information and Communication Technologies (ICT). Topics like smart grids, smart transport, smart buildings and even smart cities are

increasingly under discussion as part of a sustainable future. ICT is a typical area in which standards have played a vital role for decades.

The Committee considers that it is advisable to make use of patent information systems, as a tool for technology transfer for the benefits listed in this Part: training, leapfrogging, business strategy, public policy, and exploitation of unprotected inventions. Nonetheless, a word of caution applies - while patent information databases are a useful tool for technology transfer, they are not a substitute for technology transfer which takes place by means of licensing and collaboration agreements, as discussed below in Part III.2.

### **III.2 Green technology voluntary licensing**

There are many practical ways to transfer technologies, and intellectual property plays a key role in these processes. The intellectual property in many green technologies is owned by the private sector and research institutions in industrialized countries. This, of course, does not imply that technology transfer unilaterally originates from industrialized countries. Developing country parties are also engaged in research and development in green technology fields, perhaps not to the same extent.

A common way for IP owners to exploit their IP is to incorporate the invention into their products. But licensing for revenue, expansion of market, or other strategic objectives, is also a common means of commercial exploitation of intellectual property. Development collaboration projects in which parties conduct separate or joint R&D, protect the resulting IP and possibly cross-license such IP, are yet another form of potential exploitation of IP. All of these ways of developing and disseminating green technology can be used in relations between parties in industrialized and developing countries.

Voluntary IP licensing is the most efficient tool to share and transfer technologies. IP can facilitate collaboration, training, research between companies as well as between and with universities/scientific institutions and the private sector. Despite its utility as a tool of technology commercialization, patent/IP licensing is often misunderstood or poorly understood by persons who criticize the patent/IP system. It is easier to share a patented technology (as compared to a non-patented technology), because the owner is protected against infringement. Many companies follow an open innovation strategy of gaining access to new technologies by licensing-in rather than exclusively developing their own technology. Licensing is also commercially attractive because it enables IP owners to exploit their proprietary technologies in new markets through partnerships with licensees.

Patent licenses are often not enough because most of the time, implementation of a technology is not possible without transfer of know-how/trade secrets. For this reason, package (hybrid) technology licenses, whose subject matter includes patents, copyright works and know-how/trade secrets, are used by many businesses. Such package licenses may be combined with agreements to provide training to licensee personnel. The goal of technology transfer is to create a more level playing field between licensor and licensee, so that the licensee becomes an active participant in the ongoing development and elaboration of the technology. Such licensing succeeds because it is based on mutual interest. The licensee is not a passive purchaser of technology products, but a collaborator whose interest in the technology grows over time.

The Committee strongly supports programs that aim at facilitating voluntary package (hybrid) technology licensing and development collaboration.

### III.2.1 WIPO GREEN

The WIPO GREEN program<sup>26</sup> aims at promoting package technology licensing agreements for green technologies in order to accelerate their dissemination throughout the world, especially in developing countries. This program involves an online platform that provides information to private and public sector entities from around the world, on available green technologies and specific technology needs. The goal is to create a global network promoting partnerships with companies committed to offer a package comprising all relevant and crucial elements: patent licenses, know-how/trade secrets, technical documentation, training programs, etc. The role of WIPO is limited to facilitating partnership and WIPO is to remain neutral in the negotiation of projects and collaborations. At the same time, WIPO, through a comprehensive network of partners of WIPO GREEN, intends to facilitate the involvement of service providers, such as for competent negotiation of technology transfer agreements, in particular for less experienced parties, and of financial institutions (development banks, governments, venture capital).

WIPO has also conducted interactive training for developing country scientists, lawyers, businesspersons and government officials in IP licensing skills. Successful Technology Licensing programs have been offered in dozens of countries and translated into many languages. The Committee supports technology licensing training as a way to empower developing country parties to participate in the negotiation of win-win contracts. Such training programs could be broadened to include training in the negotiation of development collaboration agreements, where both parties participate in technology development and IP creation.

The Committee considers that it is fundamental that the WIPO GREEN database integrates comprehensive technology packages that enable the licensee to absorb the transferred technology effectively. The licensee would also be able to contribute its own competence and expertise, e. g. by creating adaptation solutions for the transferred technology to meet local needs, or by developing improvements or derivative works and granting meaningful licenses back. It is also critical that training programs to develop licensing skills in developing countries be continued, so that developing country parties to WIPO GREEN transactions will be empowered to negotiate the IP and other material terms of their contracts.

As a practical matter, the needs of developing countries and emerging economies are varied. Many developing countries require access to available technology as packages (patents, know-how/trade secrets, training, etc.). In some cases, governments and the private sector in developing countries should identify needs and develop national strategic objectives in green technology. An otherwise excellent license to solar technology may not promote the national education, technology development and innovation strategy of a given country.<sup>27</sup> Although

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<sup>26</sup> [www.wipo.int/green](http://www.wipo.int/green) .

<sup>27</sup> In this context, the UNFCCC TEC (Technology Executive Committee), the policy arm of the Technology Mechanism is managing:

**National Needs and Requirements Assessments: an overview of the Parties' technological needs in order to catalyse development**

Final

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WIPO has worked to support national IP strategies in many developing countries, and other international organizations assist on related science and education policy development, these initiatives do not always link to the task of defining the *specific* technology and IP objectives for the country. This must also be pursued simultaneously with the elaboration of national patent/intellectual property, science, technology and innovation as well as education strategies. These strategic initiatives are the work of national policy makers and must be carried out with due respect for national choices and priorities.

Finally, in order for licensing to work as a tool for technology distribution, mutuality of contribution is essential. Scientists and researchers in developing country businesses and research institutions must be supported and encouraged – by their own governments and by international institutions - to find and refine green technology solutions. This will give them greater capacity to absorb licensed technologies, greater bargaining power in negotiation, and a greater ability to contribute to the technology collaboration.

### III.2.2 IRENA Information Platform for Renewable Energy Patents and Standards

IRENA<sup>28</sup> has initiated the development of a web-based information platform which aims at integrating the existing information regarding the national and international standards as well as patents in the field of renewable energy technologies (RET) (a pilot was intended to be ready by end of 2013). This project seeks to achieve the following objectives: (1) improve access to, and optimize search and retrieval of relevant information on standards and key patents for RET; (2) promote the significance of patents and standards as policy instruments for the development of RET; and (3) foster cooperation between stakeholders coming from different countries and regions. The platform will display compiled data on: (1) international

National Needs and Requirements Assessments:

(1) provide a set of country-driven activities that identify and determine the mitigation and adaptation technology priorities of developing country Parties; (2) involve different stakeholders in a consultative process to identify the barriers to technology transfer and measures to address these barriers through sectoral analyses; (3) may address soft and hard technologies, such as CCMT and adaptation technologies, identify regulatory options and develop fiscal and financial incentives and capacity-building

**Technology Road Maps (TRMs): an action-oriented overview of the technology offered in a given field**

- (1) TRMs can be used to catalyse innovations that allow existing technologies to adapt to new markets and settings;
- (2) TRMs can mobilise private and public sector parties' interest in technologies through their participation in the roadmapping process, and can connect them with relevant counterparts in developed countries;
- (3) TRMs can provide a common platform to mobilise international support. Foreign financial flows for actions like supported Nationally Appropriate Mitigation Actions (NAMAs) and National Adaptation Programmes Action (NAPAs) may be more significant and more effective when they are backed by a roadmap;
- (4) TRMs can also link to Technology Needs Assessments (TNAs) and Technology Action Plans (TAPs);
- (5) TRMs help countries face the challenge of having to align various technology-related projects from different funders, often working with different ministries within a country. An underlying TRM can serve as a common platform, integrating such projects into a coherent strategy supported by all ministries and donors engaged.

<sup>28</sup> International Renewable Energy Agency, see <http://www.irena.org/home/index.aspx?PriMenuID=12&mnu=PriPriMenuID=12&mnu=Pri> .

standards existing and under development for RETs; (2) filed RET patents; (3) information on the use of patents and standards for policy-makers and other stakeholders; (4) information on the benefits of IPR, standards, testing and certification for RET deployment.<sup>29</sup>

### III.2.3 Patent “commons”

In the field of green technology, two patent commons have been created by private entities to encourage the dissemination of green technologies: the Eco-Patent Commons and GreenXchange.

The **Eco-Patent Commons** was launched in 2008 by IBM, Nokia, Pitney Bowes and Sony, under the auspices of the World Business Council for Sustainable Development (WBCSD).<sup>30</sup> Members pledge to the Eco-Patent Commons patents that have environmental benefits. Pledged patents<sup>31</sup> may be exploited by any third party for free, without previous formal written agreement with, or even notification to, the patent owner. The Commons is not a license but rather an agreement not to assert patent infringement as long as the patentee deems that the use benefits the environment. However, a licensee will be subject to a “defensive termination” provision if the licensee asserts a patent infringement claim against the patentee. The defensive termination rules of the Eco-Commons state that the pledge not to assert patent claims will not be honored against a party that practices the patent in the following two situations:

“(a) That party is a member of the Commons and such party (or someone acting in concert with that party) asserts an unpledged patent, with a primary IPC class on the Classification List, against that Patent Pledger's infringing machines, manufactures, processes, or compositions of matter (including products, services, and components thereof) where such infringing items alone (or when included in a product or service) reduce/eliminate natural consumption, reduce/eliminate waste generation or pollution, or otherwise provide environmental benefit, or (b) The party is not a Member of the Commons and asserts any patent infringement claim against that Patent Pledger or are infringing machines, manufactures, processes, or compositions of matter (including products, services, and components thereof).”

**Green Xchange** was another patent commons founded by Nike and Best Buy in 2010. This association partnered with the non-profit organization Creative Commons. Members were to make their technologies available in three ways:

1. By allowing their patent portfolios to be used in basic academic research in order to promote open collaboration, innovation and inventions.

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<sup>29</sup> At the time of completion of this Report, the specific status of the described IRENA activity is not known in detail. Generally, it must be observed that too many different technology and patent information data bases in the green technology field are not likely to make a positive contribution to transparency in the field.

<sup>30</sup> It was later joined by more companies: Bosch, Dow, DuPont, Fuji-Xerox, Hitachi, HP, Ricoh, Taisei and Xerox. Since 2013, the Eco Patent Commons has been hosted no more by WBCSD but by the Environmental Law Institute. The actual status can be seen under <http://ecopatentcommons.org/>.

<sup>31</sup> Some 100 patents have been pledged.

2. By voluntarily designating selected patents to be made available under a standard license agreement for green technology uses only. The licensee has to pay fees unless the license is being granted royalty-free.
3. By contributing to a know-how registry by sharing non-patented information. Even if the license is for free, patent users have to register.

It appears that, at the time of this writing, Green Xchange is no longer functional.

The Committee considers that patent commons may be beneficial, particularly for public research. But there are major limitations of patent commons: one being the likelihood that patentees will pledge only non-strategic patents, and defensive termination clauses create potential constraints for licensees that incorporate licensed technology into their products. For these reasons, green patent commons have not gained any substantial commercial relevance in spite of the fact that their existence already dates back over five years.

### III. 3 Incentives for voluntary licensing and collaboration

One of the challenges in promoting voluntary licensing and collaborative projects in green technologies is that the private sector in industrialized countries has not defined financial benefits that will flow from licensing to parties in developing countries. The potential long-term benefits of expansion into new markets is not always appreciated, especially when short term profits are achievable in domestic markets and in other industrialized countries. Accounting and tax rules focus on quarterly or annual revenues and boards of directors perceive their fiduciary duty as optimizing shareholder benefits in the subsequent quarter. Only visionary leadership results in the private sector perceiving the value of investment in developing country markets.

In order to make voluntary licensing initiatives work as an effective means of increasing access to green technologies for developing countries, industrialized countries whose citizens possess high numbers of patents in green technology fields should consider providing fiscal and other incentives to promote participation in licensing and development collaboration agreements with developing country parties. Such initiatives are not unprecedented. Article 66.2 of TRIPS provides: “Developed country Members shall provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to least-developed country Members in order to enable them to create a sound and viable technological base.” Article 66.2 only applied to least developed countries, but it required developed country member state governments to adopt laws / regulation / policies to promote technology transfer. However, implementation of Article 66.2 in member states has been criticized as inadequate because of vague definitions of “technology transfer” and also the lack of reporting.<sup>32</sup> A wide range of activities have been characterized in WTO working groups and commentaries as “technology transfer”, including, *inter alia*, training, purchase of equipment, donations to drug development programs, good governance training. IP licensing agreements - the normal definition of technology transfer in industrialized country practice - is absent from Art. 66.2 technology transfer definitions. Equally, technical training agreements and development collaboration projects, both normally involving know-how transfer as well as IP licenses, were also absent from Art. 66.2 reporting.

<sup>32</sup> See Moon, Suerie, International Centre for Trade and Development (ICTSD) Policy Brief No 2, December 2008, « Does TRIPS Art. 66.2 Encourage Technology Transfer To The LDC's?: An Analysis Of Country Submissions To The TRIPS Council (1999-2007) ». <http://ictsd.org/i/publications/37159/>

Further study should be given to legislative and policy models that would provide tax incentives,<sup>33</sup> export and customs facilitation, subsidies, credits, and awards to industrialized country companies that use voluntary licensing of green technologies to developing countries as a means to expand market share and disseminate green technologies. Technology transfer should be clearly defined in such legislative and policy models as including IP licenses and development collaboration agreements where technical training and/or joint research are integrated into the project.

### III.4 Technology Mechanism and Green Climate Fund

The Technology Mechanism (TM) has been created at the Cancun/MX Conference of the Parties (COP-16) to the UNFCCC in December 2010.<sup>34</sup> The Climate Technology Centre and Network (CTCN) is a key institution of the TM. Its purposes are to facilitate transfer of ideas, projects, to stimulate networks, connections, and to identify needs and technologies. IP was one of the main topics discussed during the numerous meetings<sup>35</sup> held to make it operational. Some countries (e.g. Algeria, Ecuador, China, Kazakhstan, and Kenya) were keen to deal identify obstacles and barriers to the transfer of technology. Other countries such as Germany, Japan and the United States were opposed to this.

Furthermore, at the Cancun/MX Conference of the Parties in 2010 (COP-16), the Parties decided to officially create a Green Climate Fund (GCF) to raise and allocate funds to allow developing countries to effectively combat climate change. The GCF has the objective of raising USD 100 billion per year by 2020. To kick-start environmental projects, a Fast Start Funding of the GCF was agreed upon, encompassing USD 30 billion for the period 2010 - 2012. All developing countries that are a party to the Convention can have access to the Fund's resources to finance any costs incurred for activities that allow enhanced action with regard to technology transfer. At the Durban/ZA Conference in December 2011, the GCF was appointed as the body in charge of guaranteeing the financial operations of the UNFCCC.<sup>36</sup> The Committee will further monitor the developments of TM (not yet fully operational) and Green Climate Fund (still in formation). We note at this time that the TM and Fund, in order to be an effective means of green technology transfer, will need to address how developing country parties can use voluntary licensing and development collaboration to build indigenous research capacity and develop intellectual property ownership.

In order to arrive at a win-win strategy and an efficient way of technology transfer within an urgent time frame, one must pay significant attention to the financial aspects. Technology transfer by patentees and technology owners must be compensated by royalties or other equivalent value (e.g. cross licenses of IP), otherwise it is not realistic to expect private sector

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<sup>33</sup> Which actually is given under a number of agreements for the avoidance of double taxation between industrialized and developing countries (not only LDCs).

<sup>34</sup> [http://unfccc.int/ttclear/templates/render cms\\_page?TEM\\_home](http://unfccc.int/ttclear/templates/render cms_page?TEM_home) .

<sup>35</sup> Inter alia in Bangkok, TH, in April 2011, in Bonn in September 2011 and in Durban, ZA, in December 2011. The first Advisory Board Meeting of the CTCN, was held in May 2013 in Copenhagen, DK.

<sup>36</sup> GCF held meetings in Geneva, CH, in August 2012, in Songdo, KR, in October 2012, in Berlin, DE, in March 2013 and Songdo, KR, in June 2013. Generally for the GFC, please refer to <http://gcfund.net/home.html> .

parties to transfer technology. On the other hand, if “technology transfer” is loosely defined, funding may be used for projects that do not involve the actual transfer of technology and do not result in any benefit to the developing country parties.

The Committee suggests that further study is warranted to identify the relationship of Climate Change Funds to technology transfer agreements.

### **Part III Conclusion**

The Committee strongly supports implementation programs that promote access to green technology information and voluntary package (hybrid) technology licensing (including –but not limited to licenses under patents, copyrights and know-how/trade secrets) and research and development collaboration agreements. The Committee further supports programs that help support innovation infrastructure, research capacity and licensing training in developing countries so that parties in those countries can become collaborative partners in the challenge of developing and spreading climate change mitigation and adaptation technologies. It also supports programs that contribute to dissemination of technical knowledge such as the global patent information system, as the EPO’s *Espacenet*, in combination with its Y02/Y04S classification scheme and *PatentTranslate*; as well as WIPO’s *PATENTSCOPE*, with its *CLIR*. In the same way it favors programs that produce statistical evidence upon which climate change negotiations and policy making may be based.<sup>37</sup>

Patent licenses alone in most cases will not solve the problem of access to green technology for developing countries. Effective technology transfers should be based on package (hybrid) technology licensing of IPR (patents and know-how/trade secrets, training programs, etc.). For the medium and long term, though to be taken forward immediately and with vigor, the main issue to be addressed is investment into the establishment and enhancement of: (1) a well functioning IP environment, comprising IP awareness, IP infrastructure and IP enforcement, and (2) education (all three levels).

Although considerable multilateral collections of patent literature are available over the Internet, free-of-charge, patent information systems could be further developed to expand the coverage to all IP Offices. Additionally, legal status data availability deserves to be greatly improved.

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<sup>37</sup> For example EPO’s *PATSTAT*.

## Overall Conclusions and Suggestions

*The findings and recommendations that follow represent the views of the members of the AIPPI Special Committee on Intellectual Property and Green Technology (Q198), and do not necessarily represent the views of AIPPI as a whole. The Committee recommends that these findings and recommendations be considered in the near future as part of the international working process of AIPPI, with the objective of reaching a resolution thereon in support of international harmonization of laws and best practices in this area.*

1. Fundamental changes in IP architecture and laws are not needed in order to support the development, commercialization and use of climate change technologies in industrialized and developing countries.
2. A more creative and vigorous implementation of IP systems and related innovation infrastructure, especially in developing countries should be supported. This includes:
  - IP asset development (including increased use of the patent system by developing country inventors in research institutions and businesses),
  - strengthened education and innovation ecosystems,
  - promotion of IP licensing and research and development collaboration as means of technology transfer,
  - incentives for industrialized country parties to participate in IP licensing and R&D collaboration agreements with parties in developing countries,
  - continuation and intensification of IP training programs to develop skills in patent drafting and IP contract negotiation by developing country parties, and
  - use of patent information to facilitate dissemination of technical knowledge, technology commercialization and collaboration.
3. In view of the technical complexity of the problems to be solved in the climate change context, research and development collaborations in green technology fields should be favored and incentivized. Such collaborations should include research institutions and enterprises from industrialized countries, emerging economies and developing countries alike. Treatment of background and foreground IP from such collaborations should equitably address in contracts between the parties.
4. Patent search tools, such as those developed by the European Patent Office in the green technology field (especially classifications Y02 and Y04) which now are part of the new Cooperative Patent Classification (CPC), and WIPO's *PATENTSCOPE*, should be promoted to facilitate access to, and dissemination of, relevant technical knowledge. Services supporting analysis of patent filing trends and patent landscaping, which produces evidence to support policy making in climate change related aspects, such as EPO's *PATSTAT*, should also be supported. Efforts should be made to complete the scope of patent information digitally available, including also the patent literature from all smaller IP Offices, either individually or through larger multilateral collections. Equally, the worldwide legal status of corresponding patent applications should be made available to the public.

5. Further studies, covering additional geographical areas, should be made such as the joint UNEP/EPO study on patenting of climate change related technologies in Africa, to inform policy makers and the public on the patent landscape in various regions.<sup>38</sup> Such empirical data may assist in developing national innovation and IP strategies.
6. The new WIPO GREEN program aims at furthering voluntary licensing of green technology packages (including –but not limited to licenses under patents, copyrights and know-how/trade secrets). This program should, therefore, be supported and evaluated over time to determine to what extent it is effective in promoting green technology transfer.
7. In order to make any voluntary licensing initiatives work as effective means of increasing access of developing countries to green technologies, industrialized countries whose citizens possess high numbers of patents in green technology fields should consider providing fiscal and other incentives to promote participation in licensing and development collaboration agreements with developing country parties. Also, further study is warranted to define effective incentives for green technology licensing and collaboration.
8. We must expect that the debate surrounding *Green technology and IPRs* will remain a global issue for the foreseeable future and could develop dynamics that might seriously damage the reputation of the patent system at an international level. It will be vitally important to broaden the use of the IP system so that inventors and entrepreneurs in developing countries can participate as IP owners and contribute to the development of green technologies. Therefore, the Committee should continue to monitor the developments in this field closely and endeavor to interpret them appropriately. This applies particularly to the discussions in the UNFCCC / COP context, especially where they relate to the Technology Mechanism.
9. When deemed necessary, the Committee should produce further reports to inform the AIPPI Board and members following established AIPPI rules and procedures. Such reports should also be used for outwards directed communications or statements to dispel misinformation and serve as a resource for accurate information about the functioning of the intellectual property system.

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<sup>38</sup> A further study by EPO/UNEP regarding Patents and climate change mitigation technologies in Latin America is scheduled to be published in 2014.



## **Annex 1**

### **Names and Functions of Members of Standing Committee on Intellectual Property and Green Technology**

Chair	Bertram Huber	(Germany)
Co-Chair	Casey Kook-Chan An	(Korea)
Secretary	Guillaume Henry	(France)
Members	Estelle Derclaye Cynthia Cannady Clara Neppel David Merrylees Lakshmi Kumaran Wen Cao Keiji Kondo Adelhart Krüger Ms. Natalie Raffoul	(United Kingdom) (United States of America) (Germany) (Brazil) (India) (China) (Japan) (South Africa) (Canada)
Responsible Reporter	Sarah Matheson	(Australia)