



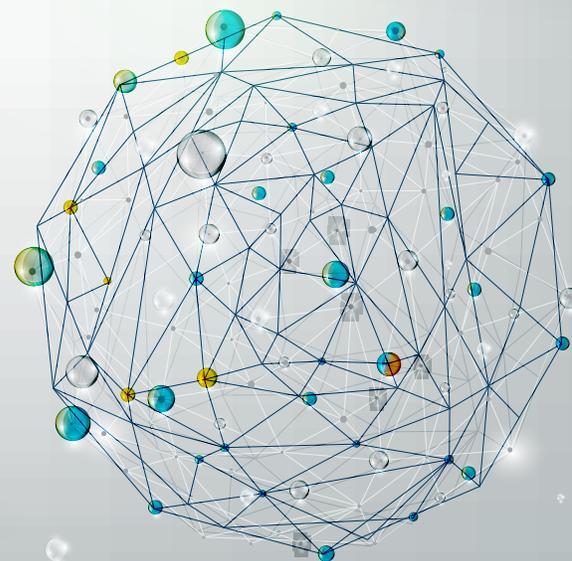
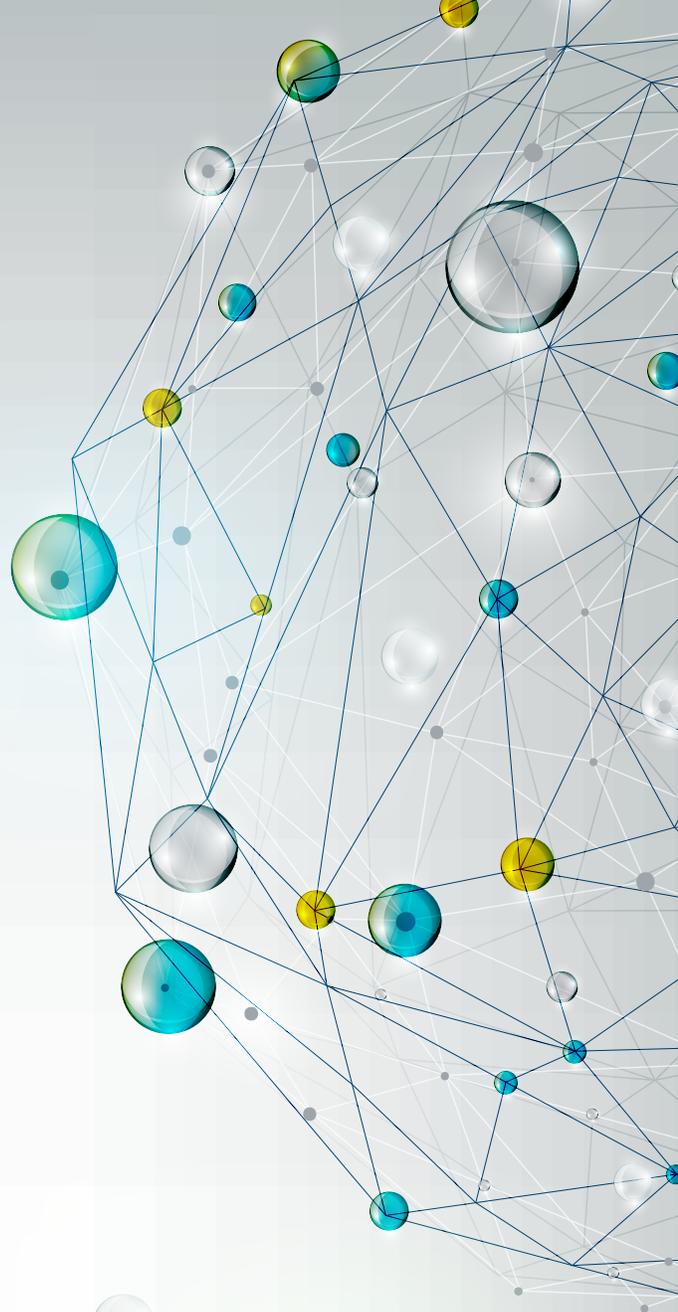
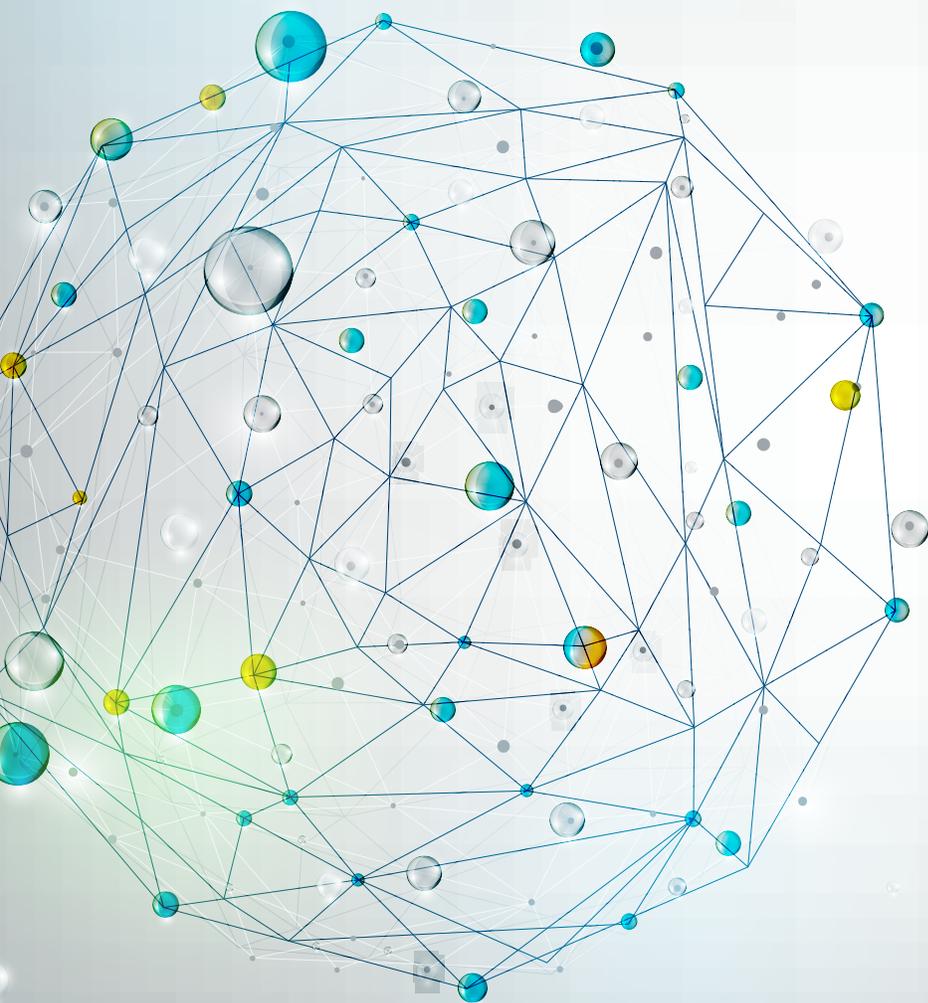
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# GLOBAL PATENT PLEDGES A COLLABORATIVE MECHANISM FOR CLIMATE CHANGE TECHNOLOGY

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BASSEM AWAD





**GLOBAL PATENT PLEDGES:  
A COLLABORATIVE MECHANISM FOR CLIMATE CHANGE TECHNOLOGY**

**Bassem Awad**



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## **TABLE OF CONTENTS**

<b>iv</b>	About the ILRP
<b>iv</b>	About the Author
<b>1</b>	Acronyms
<b>1</b>	Executive Summary
<b>1</b>	Introduction
<b>3</b>	Patent Law and Access to Climate Change Technology
<b>4</b>	The Emergence of Collaborative Models for Green Technology Innovation and Their Rationale
<b>5</b>	Modalities of Patent Pledges in Green Technology
<b>8</b>	Toward a Legal Framework for Green Patent Pledges
<b>9</b>	Conclusion
<b>9</b>	Works Cited
<b>12</b>	About CIGI
<b>12</b>	CIGI Masthead

## ABOUT THE ILRP

The International Law Research Program (ILRP) at CIGI is an integrated multidisciplinary research program that provides leading academics, government and private sector legal experts, as well as students from Canada and abroad, with the opportunity to contribute to advancements in international law.

The ILRP strives to be the world's leading international law research program, with recognized impact on how international law is brought to bear on significant global issues. The program's mission is to connect knowledge, policy and practice to build the international law framework — the globalized rule of law — to support international governance of the future. Its founding belief is that better international governance, including a strengthened international law framework, can improve the lives of people everywhere, increase prosperity, ensure global sustainability, address inequality, safeguard human rights and promote a more secure world.

The ILRP focuses on the areas of international law that are most important to global innovation, prosperity and sustainability: international economic law, international intellectual property law and international environmental law.

## ABOUT THE AUTHOR



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Bassem served for several years as a judge and head of the Commercial and Intellectual Property tribunal at the Egypt and United Arab Emirates Appeal Court. His current research at CIGI focuses on the role of intellectual property rights in addressing the global challenge of climate change and sustainable development under the international trading system.

Bassem received his Ph.D. and LL.M. degrees in intellectual property from the University of Montpellier in France, and an LL.M. in international business law from the University of Paris 1 Panthéon-Sorbonne. His experience includes working in both common and civil law jurisdictions and conducting a number of research projects for international and regional organizations. He is a member of the International Association for the Advancement of Teaching and Research in Intellectual Property, and of the Editorial International Committee of the journal *Cahiers de Propriété Intellectuelle*. Bassem's research interests include patent law; copyright law; IP and development; comparative intellectual property; and governance of intellectual property rights.

## ACRONYMS

COP	Conference of the Parties
COSIA	Canada's Oil Sands Innovation Alliance
FRAND	fair, reasonable and non-discriminatory
GCF	Green Climate Fund
GPPH	Global Patent Prosecution Highway
IP	intellectual property
OECD	Organisation for Economic Co-operation and Development
TRIPS	Trade-Related Aspects of Intellectual Property Rights
UNFCCC	United Nations Framework Convention on Climate Change
USPTO	United States Patent and Trademark Office
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

## EXECUTIVE SUMMARY

Technology lies at the centre of the climate change debate and plays a pivotal role in addressing the global challenge of climate change and sustainable development in today's economy. Access to and timely diffusion of green technologies required for adaptation and mitigation are among the major challenges faced by the international community. The role of the patent system has become the subject of increased attention in climate change discussions on technology transfer. The core technology that should be disseminated with the patent granted is not easily accessible in practice or has little technical value. New mechanisms for collaborative innovation are required to foster the green technology sector.

This paper maintains that the simple existence of a patent on a green technology innovation is not a barrier in itself to the transfer of that technology. Much depends on how the exclusive rights that come with a patent are deployed, and how those rights can be used in transferring green technology. The paper examines the various forms of patent pledges related to green technology and their rationales by analyzing three main models of green patent pledges: Eco-Patent Commons, GreenXchange and Canada's Oil Sands Innovation Alliance (COSIA). The paper concludes by suggesting a model legal framework for green patent pledges and calls for a global system to share green patents, governed by an international body where accession rules are open to third parties based on fair, reasonable and non-discriminatory terms.

## INTRODUCTION

Technology lies at the centre of the climate change debate and plays a pivotal role in addressing the global challenge of sustainable development in today's economy. The transfer and timely diffusion of green technologies required for mitigation and adaptation are among the major challenges faced by the international community (Correa 2011, 37). Recent reports demonstrate that trade, when accompanied by appropriate regulation, can facilitate the transition to a green economy by fostering the exchange of green goods and services, including technologies, and by increasing resource efficiency and generating economic opportunities and employment (United Nations Environment Programme 2011; World Bank 2012; Organisation for Economic Co-operation and Development [OECD] 2011). Developing the green economy requires new business models that reduce environmental impacts to transform our world and achieve the United Nations Sustainable Development Goals.<sup>1</sup>

Green technologies (also called environmentally sound technologies or climate-friendly technologies) cover the full spectrum of innovations that protect the environment, are less polluting, use all resources in a more sustainable manner, recycle more of their wastes and products, and handle residual waste in a more acceptable manner than the technologies for which they were substitutes (United Nations 1992, chapter 34). Green technologies include renewable energy-generation technologies such as solar, wind, hydro, wave and tidal, geothermal and biofuels; energy storage technologies such as fuel cells and advanced batteries; transportation technologies such as hybrid and electric vehicles; energy infrastructure technologies, including smart grid, energy-efficient power systems, building materials and lighting technologies, bio-based plastics and other materials, water filtration and desalination systems; technologies that reduce pollution and emissions; and even carbon trading schemes and other green policies and investment mechanisms (Lane 2011, 1). Green technology innovation and its transfer are

<sup>1</sup> On September 25, 2015, the 193 countries of the UN General Assembly adopted the 2030 Development Agenda entitled "Transforming Our World" (<https://sustainabledevelopment.un.org/post2015/transformingourworld>). The Sustainable Development Goals include the goal of ensuring access to affordable, reliable, sustainable and modern energy for all, while promoting sustainable industrialization and fostering innovation.

key components of the fight against climate change, in both mitigating and adapting to its harmful effects.<sup>2</sup>

Since the United Nations Framework Convention on Climate Change (UNFCCC) Bali meeting in 2007, the role of the patent system has been the subject of increased attention in climate change discussions on technology transfer.<sup>3</sup> Discussion has centred on how the patent system can foster green innovation and promote dissemination of clean technologies on both the national and international stage. The patent system is based on preserving the balance between the public welfare and private incentives. Public welfare is realized when knowledge is disseminated and widely used by members of society. Private incentives are conferred on inventors and creators by allowing them to exploit their works economically.

The patent system performance, however, indicates that the core technology that should be disseminated with the patent is not easily accessible in practice, or has little technical value. The overlap of patent rights in the hands of multiple owners makes it impractical to use the patented invention. The “tragedy of the anticommons” (a term coined by Michael Heller and Rebecca Eisenberg [1998, 698]) arises when too many owners with blocking power hold rights on previous innovations, thus restricting future research (*ibid.*; Magerman 2011, 8). The blocking of knowledge and research tools through multiple patents has revealed concerns about the effects of the patent system on climate change technology innovation.

Moreover, according to the United Nations Secretariat and many developing countries, there are significant barriers to green technology innovation and its transfer, chief among them being intellectual property (IP) rights. The transfer of green technology is not available at affordable prices for developing countries due to patent laws that either limit the entry of knowledge into the public domain or limit its usage (Lane 2009, 534; Rimmer 2011; Abdel-Latif 2015,

103). Such rights create an exclusive exploitation right for the holder of the invention within a specified territory and period of time, which tends to create a monopolistic situation characterized by high prices and restrictions on the dissemination of knowledge for the use of affordable green technology innovations.

The simple existence of a patent on green technology innovation is not a barrier in itself to the transfer of that technology. Much depends on how the exclusive rights that come with a patent are deployed, and how they can be used in transferring green technology (WIPO 2008). In recent years, states, business actors and individual researchers have acknowledged the necessity of a technological collaborative mechanism in the field of clean technology to stimulate and encourage the transfer of existing and emerging green technologies among academia, public institutions and the private sector. For example, Tesla Motors, one of the world’s leading producers of electric vehicles, has publicly committed not to enforce its patents against anyone who, “in good faith,” wants to use their technology (Musk 2014). A few months later, the Japanese automotive manufacturer Toyota made available the royalty-free use of nearly 5,680 patents held globally, covering fuel cells for hydrogen-powered vehicles (Toyota 2015).

Meanwhile, in 2009, at COP 15 in Copenhagen, many representatives of developing countries called for the adoption of international rules and mechanisms to increase collaboration in international research and dissemination of clean technologies through methods that are open source rather than proprietary (Collier and Mutugu 2009, 21; Rimmer 2011, 311). One promising and prominent knowledge-sharing mechanism that can be adopted is the patent pledge, whereby a patent holder makes a voluntary public commitment to make the patent available for use by any other person.

This paper, organized into four parts, analyzes the various forms of patent pledges related to green technologies and highlights the legal components required for the green technology sector. The first part provides a general overview of the interrelationship between patent law and climate change technology. The second part presents the emergence of collaborative models for green technology innovation and their rationales. The third part examines the key forms of patent pledges related to environmentally sound technologies, including Eco-Patent Commons, GreenXchange and COSIA for the oil sands industry. The fourth and final part discusses the legal framework and governance rules for green patent pledges. The paper concludes with observations on the viability of patent pledges for addressing broader dissemination of green technology in furthering UNFCCC goals.

2 Mitigation refers to strategies that aim to slow down global warming by reducing the level of greenhouse gases in the atmosphere. Among the many mitigation technologies already on the market are renewable energy sources such as biofuels, biomass, wind, solar and hydro power; low-carbon building materials; and emerging technologies that aim to capture carbon out of the atmosphere and lock it away. Adaptation involves dealing with the existing or anticipated effects of climate change, particularly in the developing, least developed and small island countries, which are most severely affected. In addition to “soft” technologies such as crop rotation, hard technologies for adaptation include improved irrigation techniques to cope with drought, and new plant varieties that are resistant to drought or to salt water. See World Intellectual Property Organization (WIPO) (2009, 2).

3 Neither the original UNFCCC treaty nor the Kyoto Protocol expressly mentions IP in its provisions. However, interest in the role of IP rights has grown in the past few years. At the eighteenth Conference of the Parties (COP) in Doha, the UNFCCC body charged with climate change technology policy decided to include IP rights as an area for which clarity would be needed on its role in the development and transfer of climate technologies.

## PATENT LAW AND ACCESS TO CLIMATE CHANGE TECHNOLOGY

The climate change regime is young in comparison with the IP rights system. Its foundation goes back only to 1988, with the establishment of the Intergovernmental Panel on Climate Change formed by the World Meteorological Organization and the United Nations Environment Programme.<sup>4</sup> In contrast, the Paris Convention for the Protection of Industrial Property, signed in 1883, stated the basic ground rules of the international patent system and was followed by a number of treaties and agreements. It was during the Uruguay Round (1986–1994) of multilateral trade negotiations that IP rights were first incorporated into the international trading system. In April 1994, the Marrakesh Agreement establishing the World Trade Organization (WTO) was signed, with its annex 1c dedicated to IP rights.

Under the multilateral trading system, the WTO agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) incorporates a number of flexibilities that allow countries to preserve their public policy objectives. Such flexibilities include the non-voluntary licence to exploit the patented product or process without consent of the patent owner for certain public interest reasons, such as public health crises. The use of compulsory licensing may contribute to raising the degree of competition and can cause a reduction in the price of products. Nonetheless, these arbitrary regulatory interventions are controversial for both governments and private companies. Governments may hesitate to impose a compulsory licence on green technologies because of the lack of production capacity of local industry or the fear of potential negative impacts on the attraction of foreign direct investments. Patent holders argue that compulsory licences violate their legitimate exclusive right to exploit their invention and might lead the industry to reduce investments in research and development (Drahos 2011, 1; Correa 2007; Abbott 2009; Gervais 2012).

Nevertheless, many developed countries have shown relative flexibility by adopting administrative measures relating to green technology patent applications to accelerate green innovation and diffusion of such technologies. National IP offices in some countries have adopted a new accelerated examination process for green patent applications to reduce the time necessary to obtain a patent. The first model uses fast-tracking measures dedicated to green technology innovation; the second is the Global Patent Prosecution Highway (GPPH), which

accelerates patent procedures by sharing information among national patent offices.

The fast-tracking examination procedure for clean technology innovation was first adopted by the United Kingdom IP office in May 2009, followed by a number of other developed countries — although, notably, no longer by the United States — so that such innovations can receive patent protection in a few months and thus reach the market earlier (Lane 2012; Derclaye 2010; Dechezleprêtre 2013).<sup>5</sup> Green patent applications are afforded special status compared to other categories of patent applications. The fast-tracking procedure aims to reduce the time to obtain a green patent, fostering the innovation cycle by expediting the commercialization of technologies that could help to resolve or mitigate environmental impacts or to conserve the natural environment. At the same time, society in general benefits from publishing the patent information more quickly.

The second administrative measure is the GPPH, which was adopted in 2014 among 21 patent offices to facilitate and accelerate the standard examination processing of patents.<sup>6</sup> The GPPH path offers an accelerated examination for all patent applications, including clean technologies, if their claims have been examined and accepted by any other participating IP office.

Furthermore, many international organizations have launched creative initiatives to facilitate access to green technologies. In 2010, the UNFCCC established the Climate Technology Centre and Network to facilitate enhanced action on technology development and transfer.<sup>7</sup> More recently, in November 2013, WIPO launched the WIPO GREEN marketplace to facilitate adaptation, adoption and deployment of green technology solutions. The WIPO initiative includes two components: a freely accessible database of various IP assets, including inventions and know-how; and a global platform that connects technology

<sup>4</sup> In 1990, the United Nations General Assembly initiated negotiations on what later became the UNFCCC, which opened for signature at the 1992 United Nations Conference on Environment and Development in Rio de Janeiro (The Earth Summit). It entered into force on March 21, 1994, and as of October 2015 it had 196 parties to the convention.

<sup>5</sup> The fast-tracking green patent application was implemented in 2009 by national IP offices in nine countries: Australia, Brazil, Canada, China, Israel, Japan, South Korea, the United Kingdom and the United States.

<sup>6</sup> The GPPH project was launched in January 2014 among 19 IP offices; as of July 2015, it included 21 national and regional offices, including IP Australia, Austrian Patent Office, Canadian Intellectual Property Office, Danish Patent and Trademark Office, Estonian Patent Office, Finnish Patent and Registration Office, German Patent and Trade Mark Office, Hungarian Intellectual Property Office, Icelandic Patent Office, Israel Patent Office, Japan Patent Office, Korean Intellectual Property Office, Nordic Patent Institute, Norwegian Industrial Property Office, Portuguese Institute of Industrial Property, Russian Federal Service for Intellectual Property, Intellectual Property Office of Singapore, Spanish Patent and Trademark Office, Swedish Patent and Registration Office, United Kingdom Intellectual Property Office, and the USPTO. See the Patent Prosecution Highway Portal at [www.jp.go.jp/ppph-portal/globalpph.htm](http://www.jp.go.jp/ppph-portal/globalpph.htm).

<sup>7</sup> See “UNFCCC Technology Work” (<http://unfccc.int/focus/technology/items/7000.php>).

providers with technology seekers.<sup>8</sup> WIPO GREEN does not provide a standard licence agreement for green technology and does not intervene in the commercial transaction; parties are free to choose the most appropriate form for their agreement and the royalty payment.

## THE EMERGENCE OF COLLABORATIVE MODELS FOR GREEN TECHNOLOGY INNOVATION AND THEIR RATIONALE

According to the Directorate for Science, Technology and Industry of the OECD, the environment for innovation has totally changed in the past few years (De Backer, Lopez-Bassols and Martinez 2008; OECD 2010). Competition is increasing globally; knowledge has become more multidisciplinary and more diverse, making innovation riskier and more expensive. The development of an effective innovation strategy requires new mechanisms that facilitate the circulation of knowledge between independent parties. Private sector actors investing heavily in green technologies recognized the need to find a new solution to climate change challenge by seeking new approaches to get rapid access to clean technologies.

For decades, private sector firms used to negotiate different types of partnerships, joint ventures and licensing agreements to obtain technologies held by others and thus bring new products to the market (Maskus and Okediji 2010, 3). However, the urgent need for green technology diffusion, and the complexity of some technologies that are critical to addressing climate change, has led to new collaborative structures and sharing of technologies that benefit both innovators and society at large. The “own and protect” model for IP rights that dominated the global markets for a long time has evolved gradually toward a “sharing and collaboration” model. These collaborative models of green technology innovation have been inspired by their successful implementation in other sectors, such as information and communication technology and telecommunication (Collier and Mutugu; Biddle et al. 2012, 177; Ernst 2012; Contreras 2015a). They have also emerged on a voluntary basis, by technology holders who believe in the benefits of sharing technologies from several sources. Nevertheless, patent pledges raise the question of what can motivate patent holders to limit the enforcement of their patents and to allow wide dissemination of their new technological inventions.

Patent pledges offer several significant advantages, not only for private firms but also for government, research centres and society in general.

First, sharing patents promotes the advancement of research and development by allowing firms full access to and use of previous knowledge. Little progress would be made if firms were required to reproduce all the experiments of their predecessors (Krattiger and Kowalski 2007, 138; Van Overwalle et al. 2006, 143, 144). Moreover, some innovations become more valuable when they are shared. Patents pledged in the pool become available to other innovators and may resolve disputes over blocking patents.<sup>9</sup> Sharing innovations facilitates access by overcoming IP obstacles and accelerating scientific progress.

Second, sharing patents may also enable firms to verify the findings of their competitors before spending their resources and efforts on flawed research. One of the problems currently challenging scientific research across many fields is the unreliability of research results. Many results disclosed in the past few years could not be replicated (*The Economist* 2013).

Third, the disclosure of patent information among competitors may serve to reduce research and development costs. The presence of numerous patents owned by different rights-holders may no longer be an obstacle for firms when obtaining access to patented technologies (Joly 2007, 385, 400; Heller and Eisenberg 1998, 698; Adelman and De Angelis 2007, 1677, 1699). A simple contribution may permit researchers to acquire the technology needed to efficiently pursue their activities. Firms usually prefer to avoid developing research streams that are the subject of numerous patents (Lerner 1995, 463, 464).

Finally, a fourth benefit resides in the fact that green patent pledges may help some private sector firms to rehabilitate their negative reputation as venture capitalists protecting their investments.

Despite the advantages of patent pledges, a number of significant criticisms can be associated with the use of collaborative mechanisms. The first concern is that private firms lose their competitive advantage by allowing their competitors, or any third party, to make use of their patents while covering the costs of maintaining IP rights. The concept of social entrepreneurship may be advanced in this case to justify the emergence of patent pledges for clean technology innovation. It allows entrepreneurship to focus on social, cultural and environmental goals that benefit society rather than on merely maximizing individual profits (Tan, Williams and Tan 2005). Socially responsible enterprises may contribute part of their technology portfolio to promote the transfer of clean innovation and to increase sustainable development.

8 WIPO GREEN members include partners and users from public or private institutions, and the WIPO Secretariat. See “WIPO GREEN Charter” ([www3.wipo.int/wipogreen/en/about/pdf/charter\\_en.pdf](http://www3.wipo.int/wipogreen/en/about/pdf/charter_en.pdf)).

9 Blocking patents are patents that prevent further development and commercialization of a product because of potential infringement when the product is used, manufactured or sold. See Steven C. Carlson (1999).

An additional concern is that patent pledges may harbour trivial or invalid patents. Some partners may seek to obtain access to the pool of patents by offering negligible patents or ones that are likely to be invalidated in court (Krattiger and Kowalski 2007, 147). Green patent pledges can avoid this situation by evaluating and selecting the patents pledged by each contributor.

## MODALITIES OF PATENT PLEDGES IN GREEN TECHNOLOGY

In the context of environmental innovation, patent pledges are designed as cooperative ventures that allow green technology holders to pledge their patented technologies for free and widespread use (Cannady 2009). They simplify the access procedures and facilitate the non-exclusive use of materials for non-commercial purposes. Participation in and adherence to such a collaborative model requires ownership of an IP right and the pledge is usually subject to certain conditions. Green patent pledges usually take the form of community pledges, not unilateral pledges.<sup>10</sup> However, they do not yet address issues of product standardization or standards-development organizations, due to the diversity of green technology innovation.<sup>11</sup>

Sharing (or cooperative) pools of pledged patents usually take the form of either a repository of donated patents relating to a specific field of research, or a system to facilitate the licensing process or other exploitation of the patent. Unlike freely revealing the invention to the public domain, patent pledges provide control to their members over the shared knowledge. Members of the pool share their innovation, which is covered by an IP right, and allow others to use the protected work. Any improvement based on the pledged invention should be fed back to the rest of the members, with the same condition applied to access the pool. Nevertheless, the patent pledge is not a pure licensing agreement. Members do not have the right to negotiate the licensing condition of the new innovation, since it is pre-negotiated in the terms of accession.

While several green technology-sharing projects exist, three models are the most significant, by virtue of their participants and the value of the patents shared. The first

is the Eco-Patent Commons, a green technology patent-sharing of donated patents; the second is the GreenXchange, a web-based marketplace that facilitates negotiating and licensing agreements between patent holders and potential licensees; and the third is the COSIA model, a semi-open mechanism of sharing green knowledge.

### The Eco-Patent Commons

The Eco-Patent Commons is the first technology-sharing initiative that was established to foster access to green technology innovation. It was launched in January 2008 by the World Business Council for Sustainable Development, a Geneva-based group, in collaboration with a number of large multinational companies, including IBM, Nokia, Pitney Bowes and Sony. The main objective of the Eco-Patent Commons is to promote and encourage cooperation and collaboration between green patent holders and potential users, to accelerate the innovation process and facilitate sustainable development.<sup>12</sup>

The Eco-Patent Commons grew out of the success of the open-source model in the computing and software industries.<sup>13</sup> It creates a pool of knowledge by encouraging IP rights-holders to share patents for inventions that directly or indirectly provide environmental benefits. The main characteristic of this model is that patents pledged are made available to anyone for free use. No royalty is required from members to make use of the patent pledged, provided it is used in a product or process that produces some environmental benefit (Van Hoorebeek and Onzivu 2010, 13, 18; Derclaye 2010, 657, 663). Individuals, public and/or private research and development centres, universities and companies can join the pool by simply pledging at least one patent. The ownership right remains with the pledging party.

Pledgers sign a non-assertion pledge (non-assert), promising not to enforce patent rights on the donated patents as long as the patented technologies are being used to achieve an environmentally beneficial result such as machines, manufactures, processes and part of a product or service. According to the ground rules of the Eco-Patent Commons, "Implementers can make, use, sell, and import infringing machines, manufactures, processes, or compositions of matter under patents on the patent list without payment of any royalty or similar payments to patent pledgers if such infringing items alone or when included in a product or service, achieve an environmentally beneficial result." The donated patents are not in the public domain, since

10 According to Jorge L. Contreras (2015b), patent pledges are usually divided into two principal categories: community pledges and unilateral pledges. Community pledges are made by members of a specific group, according to some predetermined form or formula, with respect to a defined technology or set of patents. Unlike community patent pledges, unilateral pledges are made by firms independently and do not follow a predetermined format.

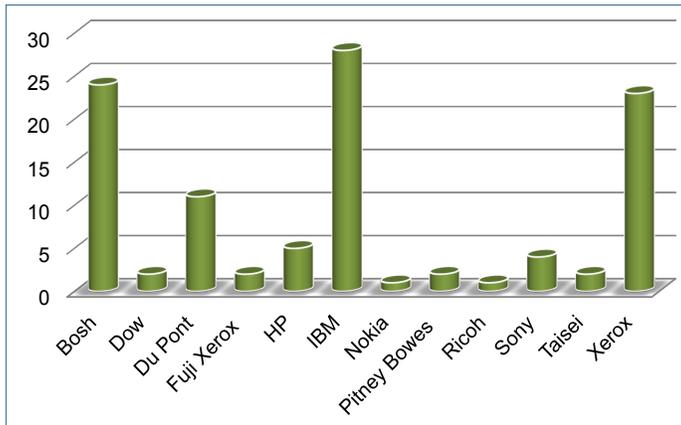
11 Technical standards are used in the information and communication technologies industry to ensure that products manufactured by different vendors can communicate and interoperate with one another seamlessly and invisibly to the consumer. Wi-fi, USB (Universal Serial Bus) and HTTP (Hypertext Transfer Protocol) are examples of technical standards used in the technology marketplace. See Jorge L. Contreras (2015c).

12 See <http://ecopatentcommons.org/>.

13 The Open Source Initiative is a collaborative effort by companies that together created a database of patents for use by the open source community. Developers are free to access and use patents in the pool for developing open source software.

the pledgers retain a defensive termination option.<sup>14</sup> The ground rules of the Eco-Patent Commons reveal that the non-assert obligation survives and remains in force even when members withdraw from the commons. Hitachi, for example, withdrew from the Eco-Patent Commons in 2012. However, its patent relating to parts recycling, pledged in 2011, is still used by members of the commons.

**Figure 1: Patents Pledged by Companies**



Data Source: <http://ecopatentcommons.org/>.

Since the launch of the Eco-Patent Commons, 105 eco-friendly patents have been contributed by 11 companies representing a variety of industries worldwide, including Bosh, Dow, Du Pont, Fuji Xerox, Hewlett-Packard, IBM, Nokia, Pitney Bowes, Ricoh, Sony, Taisei and Xerox, in addition to the hosting organization, the Environmental Law Institute in Washington, DC (see Figure 1).<sup>15</sup>

The key strength of the Eco-Patent Commons is the diversity of patents pledged across different industries, which facilitate the transfer of knowledge among green technology innovators. Nonetheless, several concerns have been raised regarding the absence of major energy players

in developing and deploying green technologies. Recent analysis also shows that most of the patents pledged are neither used nor do they represent an essential source of business advantage to their owners. Bronwyn Hall and Christian Helmers (2013), in their interesting study on the “helpfulness” of patent commons, argue that these donated patents can be used as informational tools to drive green innovation toward the interest of pledging firms. Literature on patent pledges in the context of software showed that pledging non-essential patents would enable firms to mould the wider regime that governs their activity (Hall and Helmers 2013, 37; Alexy and Reitzig 2011, 3). In fact, the climate change technology industry is relatively new in comparison to the information and communication technology sector. Firms are still looking for the appropriate format for sharing their essential green patents with other partners.

## GreenXchange

The GreenXchange initiative is a web-based marketplace in which companies can collaborate and share their IP rights, leading to new sustainability business models and innovation. The GreenXchange was born during conversations leading up to the World Economic Forum in Davos in 2009 and was launched in 2010 by Nike, Best Buy, Yahoo! and Creative Commons, along with six other organizations (IDEO, Mountain Equipment Co-op, nGenera, Outdoor Industry Association, salesforce.com and 2degrees), with the underlying belief that the best way to stimulate sustainable innovation is through open innovation.<sup>16</sup> The GreenXchange philosophy is based on sharing existing patents held by corporations and universities, using the open source community model for licensing pioneered by Creative Commons.

The mechanism adopted for sharing IP rights is the GreenXchange semi-structured public licence, which reserves some rights for the IP rightsholder while allowing others who are interested to acquire the right to use the patent in their own research. The licensing structure is available for use by any interested party, regardless of whether they are a member of the GreenXchange. Interested parties need to accept those licensing terms before accessing and using the technology.

14 “A patent pledger may, at its option, terminate and render void *ab initio* its non-assert with respect to a party if: (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 our infringing machines, manufactures, processes, or compositions of matter (including products, services, and components thereof). In the non-assertion pledge, the ‘party’ and the ‘Pledger’ includes their respective affiliates.” See “Eco-Patent Commons Ground Rules” (<http://ecopatentcommons.org/sites/default/files/docs/ecopatentgroundrules.pdf>).

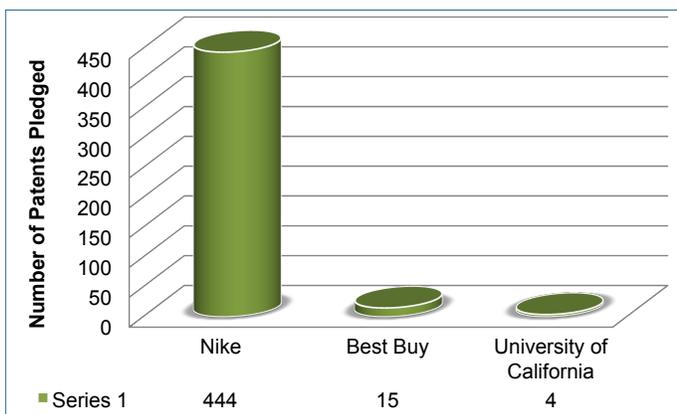
15 See “The Eco-Patent Commons: A Leadership Opportunity for Global Business to Protect the Planet” (<http://ecopatentcommons.org/sites/default/files/docs/ecopatentbrochure.pdf>).

16 The open innovation concept asserts that a company or organization should make greater use of external ideas in its business and allow its own ideas to go out beyond its boundaries for others to use in their businesses. These purposeful inflows and outflows of knowledge accelerate internal innovation and expand the markets for external use of innovation. Companies can commercialize internal ideas through channels outside of their current businesses in order to generate value for the organization. Ideas can also originate outside the firm’s labs and be brought inside for commercialization. The open innovation model is typically described in contrast to the traditional closed innovation model, in which companies tended to innovate internally, relying primarily on their own research and development departments to develop new products and process. See Henry Chesbrough (2003).

The GreenXchange model offers a standardized set of terms for patent protection that falls between “all rights reserved” and “no rights reserved.” It provides three types of licensing structures: a standard option, a “standard plus” option and a research non-exempt option. The standard option offers GreenXchange users the right to utilize the patented technology for commercial or non-commercial use. The standard plus option gives GreenXchange users a licence that requires a payment and/or sets out restrictions, for example, that the technology must be used in a certain field or geographic area. The research non-exempt option promises that the IP rightsholder will not enforce its rights against those who use the technology for academic research, or improve and adapt the patented technology for non-commercial use (Ghafele and O’Brien 2012; Lane 2011, 5).

The main difference with the Eco-Patent Commons model is the right of GreenXchange patentees to reserve their ownership and control over their patent rights. In addition, the pledgers can choose whether or not to charge a fee for the use of their pledged patent (Hall and Helmers 2013, 36; Ghafele and O’Brien 2012; Srinivas 2008, 16). This ability to reserve should, in theory, encourage the contribution of more valuable patents. In the first two years, the GreenXchange initiative received 463 patents; the majority were posted by Nike and the rest were provided by Best Buy and the University of California at Berkeley, respectively (see Figure 2).

**Figure 2: GreenXchange Patent Pledges by Companies**



Data Source: Ghafele and O’Brien (2012).

Despite the initial interest it generated, the GreenXchange initiative has not been able to satisfy its original objectives. Most of its members did not pledge any patents, and according to Roya Ghafele and Robert O’Brien, the vast majority of the posted IP cannot be used in the creation of commercial products. The challenge to develop the GreenXchange model resides in the lack of serious intention to collaborate and share innovation with other partners. Retrospective analysis suggests that the primary objective for GreenXchange members was to obtain access to knowledge in the pool and to build relationships rather

than to develop green technology innovation (Ghafele and O’Brien 2012).

## COSIA

COSIA is a recent model of green technology collaboration. It was established in March 2012 by 12 leading oil sands producers to accelerate the pace of improvement in environmental performance in Canada’s oil sands, through collaborative action and innovation.<sup>17</sup> Members are invited to share their green technologies — along with relevant IP rights — to accelerate innovation efforts while reducing the impact of the oil sands on the environment. Each member provides other COSIA partners with access to research results and royalty-free patent use rights; however, members are bound by a non-assertion clause not to enforce patent or other IP rights against another partner.

The COSIA model can be classified as a semi-open mechanism for collaboration. Green patents are shared among members of the alliance to resolve patent gridlocks in the oil sand industry. A third party has to join the alliance or negotiate and acquire licences to use patent pledges by COSIA members. The exclusivity of patent pledges among the alliance members distinguishes the COSIA model from the Eco-Patent Commons or the GreenXchange models in which, by contrast, access is open to anyone interested in the technology. In addition, COSIA members retain the right not to licence the shared technology to any other parties.

COSIA has not yet filed any patents in Canada or in the United States under the name COSIA. However, its members may be active in filing under their respective company names. Since its founding in 2012, COSIA has become one of the most active collaborative innovation hubs in Canada, with members sharing 814 distinct technologies and innovations that cost almost CDN\$1.3 billion.<sup>18</sup>

In summary, the three collaborative mechanisms of green patents described in this paper demonstrate that pledged patents are not fully in the public domain, to be used without any condition by anyone interested. They offer primary access commitments based on broad provisions indicating the access condition for both members and the public over the patent pledged.

<sup>17</sup> COSIA currently includes 13 companies that control about 90 percent of total production in the oil sands: BP Canada, Canadian Natural Resources Limited, Cenovus Energy Incorporated, ConocoPhillips Canada Resources Corporation, Devon Canada Corporation, Imperial Oil, Nexen, Shell Canada Energy, Statoil Canada Limited, Suncor Energy Incorporation, Syncrude Canada Limited, Total E&P Canada Limited and Teck Resources Limited. See [www.cosia.ca/about-cosia/members](http://www.cosia.ca/about-cosia/members).

<sup>18</sup> See [www.cosia.ca/about-cosia](http://www.cosia.ca/about-cosia).

## TOWARD A LEGAL FRAMEWORK FOR GREEN PATENT PLEDGES

The concept of collaborative innovation is not new. A white paper by the United States Patent and Trademark Office (USPTO) (2000) recognized the role of patent pools in shaping both industry and law in the United States. In his analysis of about 35 patent pools across a number of industries, David Serafino (2007, 3) concluded that there is “no single reason for creating a patent pool and no single way to manage a pool.” Despite that fact, it is necessary to discuss the required provisions for an efficient legal framework for green patent pledges.

International treaties and national IP laws do not have specific provisions for protecting or sharing green patents. The IP system is closely interrelated with many technologies that help in mitigating and limiting the impacts of climate change, whereas IP systems make no distinction between green or environmentally friendly and other technologies. At the same time, the global system of IP rights does not include provisions that would create legal barriers to the creation of a green patent pledges mechanism. Patent pledge mechanisms can be established for all types of innovation, but their establishment and organization is a challenging matter. It requires an interdisciplinary coordination of scientists, legal professionals, business professionals and support from the industry.

The first challenge is related to the governance of green patent pledges and the entity that should ideally manage the pledge system. No standard criteria exist for green technology. It could be an international agency, a government-sponsored agency, or a new private independent entity established to receive and exploit patents pledged to the pool. Eco-Patent Commons, for example, is hosted by the Environmental Law Institute in Washington, DC; GreenXchange was managed by private sector firms; COSIA created an alliance with a separate administrative body and WIPO GREEN is funded and administered by WIPO as a marketplace platform.

The best practice in other industries (such as the optical disc industry) is to let an independent licence administrator manage the pool (Den Uijl, Bekkers and de Vries 2013, 31). However, that might not be the appropriate solution for green technology innovation due to its characteristics and rapid impacts on health and environment. An international body similar to the WIPO GREEN initiative or the Green Climate Fund (GCF) under the UNFCCC may be the most suitable entity to manage green patent pledges around the globe, where the credibility and legitimacy of an international organization will dismiss concerns of different stakeholders on several levels: developed versus

developing countries; government versus private sector firms; individual innovators versus multinational entities.

The current mandates of WIPO GREEN and the GCF do not, however, include the possibility of creating a global collaborative mechanism for patent pledges. The GCF was established in 2009 within the framework of the UNFCCC to assist developing countries with climate change mitigation and adaptation practices. It supports projects, programs, policies and other activities only in UNFCCC developing country parties. The fund’s business model framework has not yet developed approaches for involving the private sector. As for the WIPO GREEN initiative, it consists of a freely accessible online database and a broad network that brings together technology providers with those seeking green, innovative solutions. Its mandate does not include the licensing, commercialization or collaborative development of green technology innovation.

The proposed global pool of green pledged patents aims to cover the current gap in the UNFCCC process by providing a secure channel for green technology deployment and transfer among various players, in both developed and developing countries, to share green innovation. The structure may benefit from the database collected under the WIPO GREEN initiative and the fund available at the GCF to facilitate the transfer and diffusion of green technologies.

The second challenge relates to the rules and regulations of such green mechanisms. In addition to the basic provisions dealing with the scope of the licence and the rights over improvements, two main categories need special attention: the accession rules and the validity of patents pledged. Accession rules should be based on fair, reasonable and non-discriminatory (FRAND) terms. Hence, access should be granted automatically to all that meet eligibility criteria and are engaged in making technology improvements available on similar terms, with a voluntary exception for firms based in developing countries. A third party should be able to access the shared technology under FRAND terms. This approach has the potential to prevent abusive practices by patent holders and eliminates major barriers in accessing green technology. Government may also play a vital role with respect to pledging patents derived from fully or partially publicly funded research related to green technology at no cost.

Finally, the validity of the patents pledged remains one of the unresolved concerns in managing a green pledge. The pledger is usually required to provide a valid patent in order to join the network. None of the three discussed models indicates whether the pledgers should keep the patent pledged in force by paying the cost of maintaining

their IP right and what the sanction in that case may be.<sup>19</sup> The proposed structure of global green patent pledges should include a provision to maintain the validity of the pledged patent to avoid pledging negligible or non-essential green patents. Pledger benefits are liable to be suspended in cases where IP rights over a pledged patent are lost due to negligence. Although it may be unreasonable to request the pledgers to disseminate and share their patents with others while continuing to pay the patent renewal fees to the national patent office, the social responsibility of pledgers in combating the harmful effects of climate change arguably could justify the obligation to maintain the validity of the patent pledged.

## CONCLUSION

According to UN Secretary-General Ban Ki-moon (2007), “Climate change is one of the most complex, multifaceted and serious threats the world faces. The response to this threat is fundamentally linked to pressing concerns of sustainable development and global fairness; of vulnerability and resilience; of economy, poverty reduction and society; and of the world we want to hand down to our children... We cannot go on this way for long... We cannot continue with business as usual. The time has come for decisive action on a global scale.” Global climate change mitigation and adaptation require new solutions to an old challenge, by seeking new approaches to get rapid access to clean technologies. In the most recent climate change conference held in Bonn, Germany, negotiators unanimously recognized the central role of technology development and transfer in achieving climate change goals.<sup>20</sup> However, the legal mechanisms of access to green technology and its transfer remain uncertain in climate change negotiations, partially due to IP rules and regulations.

Green patent pledges are a new mechanism of collaboration and knowledge sharing that may work within the existing

IP legal regime. They aim to simplify the process of finding relevant clean technologies and facilitate access to such technology. The governance of green patent pledges should be provided by an international entity sponsored and affiliated with an international organization where credibility and legitimacy can serve to resolve any concerns. The legal character of the arrangement should grant access to third parties interested in advancing the cause of climate change mitigation and adaptation. The structure of the model should be based on FRAND terms to encourage the participation of innovators from around the globe. Social entrepreneurship considerations and the urgency of climate change risk provide incentives for various stakeholders to contribute their technological innovations. Green patent pledge mechanisms may provide policy makers with a new answer to the old concern of how to accelerate the transfer and dissemination of affordable climate-friendly technologies among developed and developing countries.

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- 19 According to the Eco-Patents Commons ground rules, “Any company or other patent holder can participate as a Member in the Commons, whether or not a member of the Environmental Law Institute. Membership in the Commons is contingent on a party having: one or more approved pledged patent(s) in force... Payments of maintenance fees on pledged patents are in the sole discretion of the patent holder. When a pledged patent lapses or otherwise becomes unenforceable, the patent holder shall provide written notice to the Commons and the Patent List will be updated.” See <http://ecopatentcommons.org/about/rules>.
- 20 According to article 7.1 of the UNFCCC draft agreement (second version), dated October 23, 2015: “All Parties, noting the importance of technology for the implementation of mitigation and adaptation efforts under this Agreement and recognizing existing deployment and dissemination efforts, [shall] [should] strengthen cooperative action to promote and enhance technology development and transfer, improve enabling environments for and address barriers to the dissemination and uptake of technology, and foster cooperative approaches to research and development.” See [http://unfccc.int/meetings/bonn\\_oct\\_2015/session/9195.php](http://unfccc.int/meetings/bonn_oct_2015/session/9195.php).

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