

GREEN TECHNOLOGIES AND INTELLECTUAL PROPERTY

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ABSTRACT

Object: " GREEN TECHNOLOGIES AND INTELLECTUAL PROPERTY "

Aims: Clarifying the complex interaction between International Economic Law, Intellectual Property and Green Technologies

Author's thesis: Challenging or not IP neutrality through the international agenda on Green Technologies? An open evolution

Literature: bibliography <https://www.wipo.int/en/green-technology-book/bibliography.html>

Abstract text:

The United Nations Sustainable Development Goals (SDG) are paving the way to increased national international efforts to develop Green Technologies, aiming at meeting to the best and in an equitable way mankind's development. Intellectual Property law may move from a somehow "neutral" legal concept, to a legal concept matched to contribute to the development of green technologies. Efforts from WIPO, the EPO and the EU, among others, lead the way in this respect: the Paper will describe, in particular, how, from the WIPO Green initiative tool to new possible classes for patents related to green technologies being tested at the EPO, intergovernmental organizations and Europe take a lead in this respect. An immense literature was recently developed, and may be summarized in the WIPO Green Technology Book bibliography <https://www.wipo.int/en/green-technology-book/bibliography.html> . It also reveals the complex issue of "greenwashing" in technology, which is much of worry to policy makers and consumer organizations, and of Green Technologies, as well as of Intellectual Property under new threats connected to a difficult international environment.

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ARTICLE

In Europe and North America, but also in other regions of the world deeply affected by climate change and environmental issues, there is, over the last 25 years, a deep acceleration of technological developments that may qualify as green technology.

Green technologies are environmentally sound technologies that can be defined as per (the United Nations Program of Action from Rio, 1992, currently named "Agenda 21". Chapter 34 states that Green technologies, determined as environmentally sound technologies “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”¹.

National policies and plans with respect to development of green technologies are further spurred by the need to meet objectives of the United Nations Sustainable Development Goals (SDG). SDGs acknowledge both the need for a sustainable technology evolution, and at the same time the existence of the SDGs contribute to increased national and international efforts to develop new technologies that we may qualify as green technologies.

At business and society levels, the need for developing Green Intellectual Property is also being recognized². Yet, the exact role for Intellectual Property in promoting Green Technologies is currently discussed, together with the fact that Green Technologies could potentially challenging the current functioning of the IP system.

Clearly enough these two questions are deeply linked one to the other. The first question relates to the fact that Intellectual Property can technically be qualified as "technologically neutral". Indeed, IP rights do not relate automatically to a specific economic or scientific sector (with exception of plant variety rights). Rather, most Intellectual Property Rights, in their technological neutrality, relate to novelty and obviousness in the broad sense of the term in the sector considered, whatever it is. A trademark can be granted to a large distribution chain of low-quality products, just as it can be to a luxury brand. A patent can be granted for an invention of minor use, or of major use or social interest, in any field of technology, as per WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) Art 27³ ; and copyright, as demonstrated through an US/EU + others c -China case at

¹ Cf. United Nations Conference on Environment & Development Rio de Janeiro, Brazil, 3 to 14 June 1992 AGENDA 21, Art.34.1

² Cf. Aldona Małgorzata Dere, and Jan Skonieczny: Green Intellectual Property as a Strategic Resource in the Sustainable Development of an Organization, in Sustainability 2022, 14, 4758

³ Cf. WTO-TIPS Agreement Art. 27 reads as follows: “Article 27 Patentable Subject Matter

1. Subject to the provisions of paragraphs 2 and 3, patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application. (5) Subject to paragraph 4 of Article 65, paragraph 8 of Article 70 and paragraph 3 of this Article, patents shall be available and patent rights enjoyable without discrimination as to the place of invention, the field of technology and whether products are imported or locally produced.

the WTO Dispute Settlement Body ⁴ clearly does NOT relate to any issue of quality. Designs obey to the same logics as patents in this respect, just as plant varieties do. Technical neutrality of the Intellectual Property Rights is therefore a WTO TRIPS paradigm

Yet, it is clear that in order to develop Green Technologies, which can be sustainable and useful to society in the way paved by the UN SDGs, it is essential to spur their development and the "fuel of interest"⁵ that intellectual Property may bring, to play a major role in this respect.

International Organizations recently developed an interesting practical approach to revolve around and overcome the paradigm of technical neutrality in Intellectual Property Rights granting /obtaining mechanisms. The big non-written objective in their action is avoiding entering in debates on this matter such as those that were the consequence of the adoption of the Convention on Biological Diversity and the Nagoya Protocol ⁶, and avoiding short-circuits in the functioning of Intellectual Property Rights granting. Effectiveness in supporting the SDGs is the paradigm, even if the question of technical neutrality of Intellectual property sounds left aside.

In this respect, both the World Intellectual Property Organization (WIPO) and the European Patent Office (EPO) play an important role: indeed, rather than focusing on debating and negotiating between member States on technical neutrality and ethical characterization of Intellectual Property Rights, both organizations embarked in horizontal activities of simply putting in the forefront the various actors of green technologies developments, by using the flexibilities and margins permitted under their mandate and by making available information on Green Technologies that could/ can /

2. Members may exclude from patentability inventions, the prevention within their territory of the commercial exploitation of which is necessary to protect ordre public or morality, including to protect human, animal or plant life or health or to avoid serious prejudice to the environment, provided that such exclusion is not made merely because the exploitation is prohibited by their law.

3. Members may also exclude from patentability:

(a) diagnostic, therapeutic and surgical methods for the treatment of humans or animals;

(b) plants and animals other than micro-organisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes. However, Members shall provide for the protection of plant varieties either by patents or by an effective sui generis system or by any combination thereof. The provisions of this subparagraph shall be reviewed four years after the date of entry into force of the WTO Agreement."

⁴ WTO Case DS362: China — Measures Affecting the Protection and Enforcement of Intellectual Property Rights

⁵ US President Abraham Lincoln (1859): "The patent system adds the fuel of interest to the fire of genius"

⁶ Santiago Roca, Compatibility of the Intellectual Property Regime, the Convention on Biological Diversity and the Nagoya Protocol, GRUR International, Volume 70, Issue 4, April 2021, Pages 349–360,

would develop thanks to Intellectual Property Rights. The objective of these moves was to serve society and meeting the SDGs.

The present Article focuses on describing WIPO and the EPO's approaches developed, in particular through publications aiming an encountering between stakeholders in Green Technology, and considering the advantages and drawbacks that this approach may have, before considering whether alternative ways were/are now possible in this respect.

I- WIPO and EPO's approaches

The WIPO initiatives on Green Technologies and IP form part of its contribution to implementing the Sustainable Development Goals of the UN 2030 Agenda for Sustainable Development. Indeed, one of WIPO's nine strategic goals, as set out in the Medium Term Strategic Plan⁷, and further detailed in its biennial Program and Budget, is "Addressing Intellectual Property in Relation to Global Policy Issues." To this end, WIPO's objective is to promote expertise in the global policy debates related to intellectual property (IP), with a specific focus on three global challenges: climate change, global public health, and food security.

As underlined above, Intellectual Property Rights are characterized by their "technical neutrality": thus, the idea of creating a "green Intellectual Property Rights" would not reach a consensus among member States of IP international fora and therefore would not be a realistic short-term option. Rather, in WIPO's Program and Budget for 2012 to 2017, Member States gave WIPO the mandate to establish and maintain a functioning platform for open innovation and diffusion of green technologies, i.e. the WIPO GREEN platform⁸ and a series of annex awareness and information resource services, including national member states' ones and all described under the WIPO Green web page. The WIPO Secretariat implemented this mandate, and developed from there further initiatives. All these initiatives are also done in accordance with WIPO's Development Agenda⁹ that establishes various recommendations (numbers 25, 26, 28, 30 and 40) encouraging this International Organization to explore IP-related initiatives aiming at promoting transfer and dissemination of technology to developing countries.

⁷ WIPO MEDIUM-TERM STRATEGIC PLAN (MTSP) 2022-2026, June 2021 (WIPO Document n° WO/PBC/32/3SH /JUNE 7, 2021)

⁸ <https://wipogreen.wipo.int/wipogreen-database/database>

⁹ Cf. WIPO Development Agenda adopted at the 2007 WIPO General Assembly: <https://www.wipo.int/ip-development/en/agenda/recommendations.html>

As a result, two main outputs characterize WIPO's moves on Green Technology and Intellectual Property Rights: the WIPO GREEN platform mentioned in the above paragraph, and the "WIPO Green Technology Book"¹⁰. It should be stated again here that none of these approaches tend to establish any kind of "Green Intellectual Property Rights". The big objective pursued by WIPO is exclusively centered on creating awareness and supporting dissemination of Green technologies, i.e. responding to the following:

- Which need for Green technology?
- How green technologies support development?
- Why IP is important for the development of green technology?
- How Intellectual Property Rights support green technology growth?

Respecting the neutral link between (green) technology and IP

-Offering a showcase of existing green technologies that may satisfy both producers of these technologies and beneficiaries of them, and permit cooperation between them

A. The WIPO Green Technology Book

The WIPO Green Technology Book represents the latest main achievement of WIPO in this respect and follows the above principles of creating awareness on Green technologies and offering a showcase of existing green technologies that may satisfy both producers of these technologies and beneficiaries of them, and permit cooperation between them. This sounds a classical work for an International Organization. It focuses on the question at stake under three main classical areas where climate change impacts will be highly significant, namely:

- agriculture and forestry,
- water and coastal areas,
- cities.

Yet, the publication follows a highly innovative methodology: its added value pertains to WIPO searched examples of innovation that can provide effective practical solutions. In doing so, a large set of scientific articles, gray literature and technology databases developed by private, public and civil society entities and organizations are considered and are presented in order to show what was found possible and what can be done.

The innovative method consists in dividing technologies into three groups

- Proven technologies, which have been around for some time and are well tested;

¹⁰ WIPO Green Technology Book, WIPO, 2022 <https://www.wipo.int/en/green-technology-book/>

- Frontier technologies, which are new, less well tested but available;
- Horizon technologies, which are near-future solutions, expected on the market within the foreseeable future.

This approach goes far beyond the tasks historically performed by UN System organizations. Though it represents a new move in implementing WIPO's mandate, it does not affect by any means the fundamental technical neutrality of Intellectual Property Rights from the legal point of view, but at the same time, in practice, the inclusion of individual technologies in the WIPO Book gives some elements of quality attractiveness to them. Indeed, and this may represent the second innovative method chosen:

"The following criteria were used when selecting technologies for the Green Technology Book 2022:

- Relevance for climate change adaptation;
- Relevance for the three thematic areas:

1) Agriculture and forestry

2) Water and coastal regions,

3) Cities;

- pertain to:

- a **product or service available for purchase or licensing;**
- a **product or service available for free/open source;**
- a guidebook on application of a method or technique;
- a research project or similar (for horizon technologies).

In addition, the following factors were taken into consideration:

- anticipated impact from implementation;
- availability of sufficient quality information or third-party endorsements;
- market availability (for proven and frontier technologies);
- cost in relation to impact;
- geographical balance;
- business balance (large- and small-scale businesses, start-ups, research teams, nongovernmental organizations and so on);

- no harm principle.¹¹

Substantive IP considerations are therefore included in the selection criteria (i.e. a product or service available for purchase or licensing; a product or service available for free/open source). These two criteria play an important role in the selection of technologies listed in the Publication, together with non-IP selection criteria.

In addition, to reinforce the authoritative character of this book, WIPO authors chose to assess technology maturity according to the standard Technology Readiness Level (TRL) definition. According to this system, horizon technologies have the lowest readiness level but are still close to full development (TRL 3–6), whereas proven and frontier technologies are validated and ready for to be scaled-up if not already done (TLR 7–9).

Yet, once these criteria have been established, the question of the effectiveness of green technology transfer remains open and though the Book describes the importance of Intellectual Property Rights (especially patents) and of technology transfer that permits an invention to blossom in the marketplace and in society, it does not propose any new scheme beyond the options offered by WIPO Green.

B. WIPO Green

WIPO GREEN¹² is a public-private partnership established in 2013 by WIPO. Its main tool is an online platform for technology exchange aiming at connecting providers and seekers of environmentally friendly technologies, and is completed by other awareness and services tools that are as well developed by National IP Offices and all available through the WIPO GREEN website¹³. Through its database, network, and connected events, WIPO GREEN intends to bring together stakeholders and potential players all around the world (technology makers and technology users) to catalyze green technology innovation and diffusion. Thus, it displays in one place technologies at all stages of development, from prototypes to marketable products: technologies displayed may be available for license, collaboration, joint ventures, and sale (thus mostly implying circulation of Intellectual

¹¹ Cf. WIPO Green Technology Book, WIPO, 2022 <https://www.wipo.int/en/green-technology-book/>

¹² Cf: <https://wipogreen.wipo.int/wipogreen-database/database>

¹³ Awareness and services tools that are as well developed by National IP Offices available through the WIPO GREEN website are: Accelerated Patent Prosecution, Provision of Green Data and Analysis by the IP Office, Matchmaking and Business Rounds, Regional Cooperation on Green IP Matters, Joint Initiatives with WIPO GREEN, Classification Systems for Green Technology Solutions, Training Government Officials about Green Innovation, Green Patent Prosecution Highways, Financial Support for Green Patent Applications,, IP Awareness Raising Activities, Upcycling Program for Counterfeit Goods, IP Services for Entrepreneurs, Awards for Green Technology Innovation cf: <https://www3.wipo.int/wipogreen/en/ipo-green/>

Property Rights between technology providers and their users). By including as well as technology requests in its database, WIPO GREEN has the form of a “go-to platform”. It is funded since its creation from the regular budget of WIPO, but also received contributions from various countries (e.g. Japan, Australia, France, and Brazil). WIPO GREEN, though not offering financial support for technologies, solutions, or projects development, also presents a list of funding opportunities. Thus, it represents, for technology providers who have created an account on the platform and registered, an opportunity to explore markets and partnership opportunities.

Technologies or innovations uploaded to the database do not necessarily need to be patented, or in the process of being patented: technology providers can upload their technology while related patent applications, if any, are pending. WIPO GREEN users decide the extent to which they wish to disclose information and details about their technology on the WIPO GREEN database. There is no specific trade secrets policy in this respect.

Anyone can create a WIPO account for free and register for free as a WIPO GREEN user. Currently, nearly 4000 technologies are displayed, mostly for Intellectual Property Rights licensing. Indeed, all technologies uploaded to the database remain the property of the Intellectual Property Rights holder and it the database managers state that it is " the right holder and the collaborating parties to structure agreements in the manner they feel is most appropriate and effective". Those who upload /request technology would normally do it for commercial operations, but some of them may also act *pro bono* if they wish so. In order to support negotiations of patent licensing agreements, WIPO GREEN also provides a useful and publicly available Licensing Checklist ¹⁴

In summary, the role of WIPO in addressing Green technologies and intellectual property can be mostly identified as a role of facilitator /honest technology broker. This already represents a major achievement, without shaking the current fundamental principles of the IP System.

C. the EPO research work

The EPO's approach is in part different. It concentrates on two aspects:

- analyzing specific technologies thanks to its wealth of data contained in EPO databases (including public ones such as *Espacenet*)¹⁵ and creating (as WIPO does), awareness on them; and

¹⁴ Cf. https://www3.wipo.int/wipogreen/docs/en/wipogreen_licensingchecklist_061216.pdf

¹⁵ Cf. <https://www.epo.org/searching-for-patents/technical/espacenet.html>

- initiating exploring new forms of patent classifications that relate to green technologies or sustainable technologies.

It may also, though not on large scale, finance Academic research that may also be covering cover IP and Green Technologies¹⁶, offer online courses on IP and Green Technology, and it assigned numerous European Inventor Awards to Green Technology inventors, the result of which is showing the importance of patenting in Green Technology inventions¹⁷.

Whereas analyzing specific technologies is technology neutral, exploring new forms of patent classifications may contribute to an evolution of the use of the IP system in the future (cf. part II below)

A recent example of analyzing specific technologies and creating awareness on them is the EPO Publication on "Hydrogen patents shift towards clean technologies with Europe and Japan in the lead"(January 2023). The EPO Secretariat pooled its efforts with the International Energy Agency (IEA) to describe the innovation hubs in the field of hydrogen, its shifting towards low-emission solutions, and classifies countries' race in this field, that shows EPO countries in a leading position.

The EPO Publication uses, for the first time, global patent data to provide a detailed analysis of innovation in hydrogen technologies. It describes the major trends in hydrogen technologies from 2011 to 2020, measured in terms of international patent families (IPFs), each of which represents a high-value invention for which patent applications have been filed at two or more patent offices worldwide. Also, it covers a full range of hydrogen technologies, from hydrogen supply to storage, distribution and transformation, as well as end-use applications, a sector that has been highly prioritized by the EU post Covid19 recovery programs for funding, and as such the publication "accompanies" this effort by enabling to get a technological panorama of achievement and perspectives. Though scientifically authoritative, it has therefore a political motivation. In this respect, the publication explains that innovation responds to the need to tackle climate change, how innovation evolves from production technologies to end-use applications, the important role of chemical and automotive companies in filing hydrogen patents, and the attraction represented for finance of SMEs that hold hydrogen technology patents.

Apart from the above awareness activities that may support the European innovation ecosystem, it is widely understood among interested circles that the EPO, on its own or through its cooperation with

¹⁶ Cf. <https://www.epo.org/learning/materials/academic-research-programme.html>

¹⁷ Cf. Pratheeba Vimalnath et al. Intellectual property strategies for green innovations - An analysis of the European Inventor Awards, in Journal of Cleaner Production, Volume 377, Elsevier, 1 December 2022, 134325

various research stakeholders, is exploring new forms of patent classifications that would in the future permit easier identification of sustainable /green inventions. The issue relates to working on EPO Y classes /subclasses and how to develop them in an authoritative way that would permit to avoid both greenwashing and political tensions on defining which is a Green Technology, and which is not. This important matter remains a complex open agenda. Tests that involve Artificial Intelligence tools are likely being conducted by the EPO, and it is expected that some official outcome may be disclosed in the coming years.

II- Towards “Green IP”?

A. Advantages and limits of the approach currently chosen on Green IP at international Level

The advantages and limits of the approach developed by International Organizations considered can be summarized as follows:

- As far as public policy advantages are concerned,
 - 1- the activities conducted by the International IP Organizations considered enhance in a major way the creation and dissemination of Green Technologies thanks to the likely use of IP circulation tools (mostly licenses of Intellectual Property Rights, patenting, technology transfer arrangements);
 - 2- thus, thanks to the support of traditional Intellectual Property Rights, Green Technologies may better serve basic human needs and social objectives;
 - 3- commercial and pro bono activities are guided through exemplary options offered.
- Limits, on the contrary, are of three kinds:
 - 1- The technological neutrality of Intellectual Property Rights means that there is no specificity in Intellectual Property Rights for green technologies, and leads to the absence, in most IP Offices in the world, of a generalized IP fast-track for Intellectual Property Rights granting for green technologies, impeding a stronger international public policy support in this respect;
 - 2- The very broad definition of green technologies, and hardship in establishing stricter definitions of it, may lead to freeriding in technology offers and to various forms of “greenwashing” from both technology offers and technology users;
 - 3- The initial, but incomplete, public efforts in establishing new classes in international patent classifications, mean that a large part of existing literature on classifications of new green technologies is created thanks to private companies’ AI or traditional classification research engines. Their research activities are often developed in a neutral way, but as such do not guarantee neutrality in this respect;
 - 4- New threats connected to a difficult international political environment and raising tensions may mean that the Green Technologies may be less prioritized by Government stakeholders.

B. Towards alternative ways for the emergence of Green IP?

Time has come to considering whether alternative ways are now possible in this respect.

- 1- The first step envisaged, as in any branch of law whenever a new issue arises, is to create a *sui generis* Green IP right. Feasibility of such option is subject to time-consuming studies and negotiations, and it is hard to envisage major moves in this respect at WIPO or in any other fora. Affecting the concept of technical neutrality of Intellectual Property Rights may also open unnecessarily a “Pandora box” and lead to limited results.
- 2- The second step might be encouraging public international organizations to establishing new classes and sub-classes in international patent classifications, in order to guarantee better visibility of Sustainable/ Green Technologies and prevent as much as possible common forms of greenwashing.
- 3- Finally, it is to be noted that several national or regional IP authorities do already prioritize the examination of patent applications if they relate to climate change and the environment. It would be necessary that International Organizations active in patent granting procedures become actively involved in this respect, as this would promote green technologies’ dissemination and sharing.
- 4- Last but not the least, the development of streamlined technology transfer mechanisms in favor of developing countries, in accordance with the non-computed promises of the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) ¹⁸are a longstanding priority that climate change emergencies may further spur.

Conclusion

¹⁸ WTO TRIPS Article 66, paragraph 2: “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.”

Though the emergence of Green IP Law is far to have materialized, IP Law plays a growing and positive accompanying role in the development of green technologies. Yet, an acceleration of growth of the IP role in this respect is desirable and feasible in many areas, subject to continuous and internationally shared political impetus.