Intellectual Property Rights and Green Technologies

Guillaume HENRY
Doctor in Law
Attorney at Law
Specialized in Intellectual Property Law

Lawfirm Gaultier Lakits Szleper
12, rue Lincoln 75008 Paris - FRANCE
Phone : 00 33 1 56 88 28 28
Fax : 00 33 1 56 88 28 29
ghenry@avocatgls.net

This article was written in the context of the 42nd World Congress of the International Association for the Protection of Intellectual Property (AIPPI) in Paris.

On the 3 October 2010 it received the 1st AIPPI Academic Prize.

"The world and planet are at a crossroads. If we do not start to act with determination to reduce greenhouse gas emissions, if we continue on last century's path of the intensive increase in carbon emissions, we put ourselves at risk of real geophysical catastrophes"

Nicholas Stern, Inaugural Lecture at the *Collège de France* delivered on the 4 February 2010

If we are to believe the scientific reports of international experts, humanity is now facing an unprecedented challenge: limiting, or even halting climate change caused by human activity, the effects of which, even though they may be hard to foresee, could prove to be dramatic[1].

The 18th century was the century in which Man was emancipated from History, with the liberation of the masses from the inequalities of the *Ancien Régime* societies. The 20th century was the in which Man was emancipated from Nature thanks to technology: the end of famines in most parts of the world, the development of medicine and means of communication. The 21st century will probably be the century in which we fight to preserve Nature and try not to run the risk of its deterioration, the consequences of which could be irreversible.

Admittedly, scientists are not unanimous about the environmental outlook for the planet[2]. However, the aim of the present study is not to discuss the reality of these reports. There is a consensus among the majority of scientists on the worrying nature of the increase in temperature and the risks which a significant part of the world population is being subjected to as a result of this rise.

[1] The main source of information is compiled from IPCC reports which conclude that global warming is indisputable and that human activity is most likely the cause of it. The IPCC (Intergovernmental Panel on Climate Change) was formed in 1988 by the World Meteorological Organisation and the United Nations Environment Programme (UNEP) to assess climate change and the greenhouse effect in order to report to the United Nations Framework Convention on Climate Change (UNFCCC) about climate change. For a progress report: WTO and UNEP, *Trade and Climate Change*, 2009, p.3-45.

[2] See in particular C. Allègre and D de Montvalon, *L'imposture climatique ou la fausse écologie*, Plon, 2010. L. Maihes, "Réchauffement climatique : ce que disent vraiment les climato-sceptiques", *Les Echos*, 18 February 2010.

Two options to protect the environment: a revolution in our lifestyle choices or a technological revolution

There are several avenues of research which are enabling us to limit the impact of human activity on the environment.

The first is to limit human activity by changing our lifestyles. To do so we would have to surrender the dominant economic system, founded on our consumer- and comfort-oriented society. The "Deep Ecology" movement, appearing in the 1970s in the United States and Europe, advocated a similar radical change in society and drastically limiting the world population to 100 or 500 million inhabitants in order to avoid disturbing the global balance[3].

This first option appears to be a dead end. People are not prepared to surrender their current lifestyles. Admittedly, lifestyles can be changed, and we can hope that the consumer will favour recycled products, elect to use renewable energies, and limit any unnecessary travel[4]. But only a considerably more radical change in behaviour would be of a nature to limit the impact of our activity on the environment in effective proportions.
Without the support of the masses, the alternative route would be to enforce these radical measures. This would then run the risk of establishing a sort of "environmental dictatorship", or at least one perceived as such.
Thus, the first option is illusory, for on the one hand, relying on "radical environmental civic-mindedness" is really just a chimera and, on the other hand, coercion risks failing to achieve the desired results through a lack of support from the masses.

The second avenue lies with technology. This solution consists of conducting research into technical methods to protect our environment without necessarily reducing human activity. This involves reducing the environmental impact all the while maintaining the same level of activity. In other words, the hope is that the technologies which can be classified as "green" or "clean" can become sufficiently developed so as to save this damage being inflicted on the environment, and consequently for Man, so that we will not find ourselves in a situation where we have no other choice but to radically change our lifestyles.

This second option seems the most realistic and humanist, even though, admittedly, it carries a certain risk. If scientific research fails to discover efficient technical solutions, or indeed if the solutions are available but are not implemented with sufficient celerity, the environment will continue to deteriorate, perhaps beyond repair. This option is therefore founded on the conviction, almost faith, that intelligence and endeavour will enable us to discover technical solutions to a problem which is just as technical itself.

[3] See the description of this school of thought : L. Ferry, *Le nouvel ordre écologique*, Grasset, 1992. One of the precursors of deep ecology was the German Hans Jonas *(Le principe responsabilité. Une éthique pour la civilisation technologique*, 1979, French translation : ed. Du Cerf, 1990).
[4] On the awareness of public opinion and public institutions : J. Jurgensen, "Acteurs privés, pouvoirs publics, organismes internationaux: quels rôles?", in *L'économie verte*, Cahiers français n° 355 March-April 2010, La Documentation Française.

The challenges facing the technological revolution: the essential role of patents

We cannot allow the selection of this option of advancing green technologies to suffer from idealism. Our efforts to innovate must be great and the transition towards the widespread use of green technologies must be rapid and extend throughout the world.

The challenge is three-fold:

- encouraging innovation in the field of green technologies,
- promoting the distribution of these technologies and prompting consumers to favour products and services which integrate such technologies,
- permitting the transfer of green technologies to regions of the world which do not have the means to invest in research.

To assist in achieving this transition towards a green economy, the economic and legal instruments in the hands of politicians are plentiful. A fiscal policy focused on green technologies could accelerate their development with government research also adjusting its focus.

Nonetheless, intellectual property is at the heart of all of these matters; patent law in particular.

Alongside secrecy, the patent is now practically the universal tool used to protect inventions, since the adoption of the TRIPS agreements in 1994 under the auspices of the WTO[5].

The question is knowing if the current regulations which govern intellectual property law and more particularly patent law are likely to achieve our objectives of encouraging innovation, distributing green technologies and transferring green technologies, or if, on the contrary, they must now be amended.

The present study focuses on invention patents, since they are at the heart of the problems facing the technological revolution. This does not mean that other intellectual property rights have no role to play. Trademarks, and in particular certification marks, can play an important role in providing information to consumers, who are becoming more and more inclined to favour "clean" products and services. Copyright-protected software can also play a role, as it has been shown that buying online, which uses software (for example, online payment), helps us to reduce emissions compared with buying from a traditional shop. Nevertheless, the fact remains that invention patents are the key to the green revolution, for only technological innovations will allow us to contain the effects of human activity on the environment.

But before proceeding with my analysis, we need to consider the aims and consequently the definition of green technologies.

[5] The WTO (World Trade Organisation) was formed in 1994 by the Marrakech Accords. The TRIPS agreements (agreements on Trade-Related aspects of Intellectual Property Rights) bind each member of the WTO to adopt a corpus of regulations which establish a minimum level of protection which must be granted to intellectual property.

The various definitions of green technologies

At the present time there is no uniform definition of green technologies.

It is widely accepted that technologies can be defined as any technologies which allow, for any given human activity, the quantifiable and appreciable reduction of the impact on the environment all the while maintaining the same level of activity. This definition applies to all disciplines. It cannot be reduced to the traditional typologies and classifications of human activities. It covers the three traditional sectors: primary (agriculture), secondary (industry) and tertiary (services) and is relevant to all fields of industry: the automotive industry, chemistry, agriculture, medicine, etc..

This first definition allows us to limit the scope of green technologies.

However, we need to hone this definition with a specific distinction: adaptation technologies and conversion technologies[6].

The former allow us to adapt to environmental transformations, for example climate change. A new generation of flood defences enables us to overcome the increasing risks of flooding caused by global warming. This first category of technologies does not resolve the problem, it compensates for it. It does not fulfil the accepted definition of green technologies, for it does not reduce the impact of human activity on the environment.

The second category of technologies is conversion technologies. This category aims to reduce the impact of human activity on the environment and does therefore exhibit some progress from an environmental perspective. The technologies applied to forms of renewable energy (wind, biomass, photovoltaic), carbon capture technologies, or those which reduce the consumption of machines and appliances have the effect of limiting damage to the environment compared with previous technologies.

It is this second category of technologies which is being examined in this study.

But we still need to refine this definition in terms of the various environmental issues.

It would seem that two issues must be highlighted.

On the one hand, there is the general issue of limiting the effects of human activities on the environment. Water purification, substituting biological fertilisers for chemical fertilisers, or reducing the consumption of water in agriculture or industry, for example, are included in this definition.

Add to that a second issue, one which is more restricted but perhaps all the more pressing: the issue of drastically reducing greenhouse gas emissions in order to limit global warming, which, according to the majority of experts, is a necessity if we want to avoid risking the disruption of the large-scale climatic balances, the forecast consequences of which could be extremely serious (a rise in sea levels, the extension of deserts, etc.)[7].

[6] WTO and UNEP, *Trade and Climate Change*, 2009, p. ix, 45 et seq..
[7] The IPCC reports examine mainly these issues.

In the context of international negotiations, it is this more restricted second definition which seems to prevail. Green technologies are those technologies which allow us to limit global warming caused as a result of greenhouse gas emissions (GHG), including the following fields:

- those technologies which allow us to save energy;
- new sources of energy (wind, solar, biomass, etc.);
- technologies to filter and harness CO2 emissions.

The issue of assessing our intellectual property law system against our objective of limiting climate change involves this second definition.

The issue is one of determining if the current intellectual property regulations allow us to achieve our objectives of reducing greenhouse gas emissions or if they need to be amended.

It must be stated at this point that this issue is global. The green revolution will have only a slight effect if it is limited to a few countries. But on the contrary, a wait-and-see attitude on the grounds that some countries are reluctant to commit themselves to this revolution would be irresponsible.

The methodology applied to the issue of intellectual property rights in the face of green technologies

The accepted method of analysis consists, on the basis of work carried out by researchers, of assessing first of all if current patent regulations allow us to envisage sufficient development in innovations and their subsequent distribution, and then, if necessary, to propose certain avenues of thought which will enable us to improve the efficiency of the law to assist us in achieving the objectives of reducing greenhouse gas emissions.

This methodology presents some analogies with the discipline of "the economic analysis of law", or "Law and Economics". In effect, the latter examines the economic effects of regulations and legal institutions[8]. The aim of this discipline is to determine the effect of laws and regulations and the effect of their amendments on the economy and the distribution of wealth. It also seeks to determine how the law can be amended in order to achieve certain economic objectives.

In the context of the issues regarding intellectual property rights and green technologies, the aim is to research the most effective laws possible in order to achieve a reduction in greenhouse gas emissions.

[8] Law and Economics is a branch of economic science which consists of applying the methods and tools of economic analysis to the study of law. E. Mackaay and S. Rousseau, *Analyse économique du droit*, Dalloz, 2008, 728 p. T.Kirat, *Economie du droit*, La Découverte, 1999, p. 12 and 69 et seq..: *"one of the main concerns of the economic analysis of law relates to matter of evaluating the efficiency of law from an economic standpoint"*. See also: B. Oppetit, "Droit et économie", *Archives de philosophie du droit, Droit et économie*, v. XXXVII, Sirey, 1992, p. 17-26, *in particular* p.22; A. Strowel, "Utilitarisme et approche économique dans la théorie du droit. Autour de Bentham et de Posner", *Archives de philosophie du droit, Droit et économie*, v. XXXVII, Sirey, 1992, p. 143-171.

The efficiency of the current intellectual property system and more particularly the current patent system must be assessed on the basis of the three main challenges, which are: (1) to encourage the major economic players to back “green” innovation, (2) to promote the distribution of “green” technologies across all products and services, and (3) to allow developing countries to access these technologies.

1. The necessity of promoting "green" innovation: desirable changes

The first issue is one of knowing if the current patent system is a sufficient stimulus for green innovation, meaning those inventions which have a direct or indirect effect of limiting greenhouse gas emissions.

The most reliable method of measuring research and innovation lies with analysing patent applications. Whereas patent applications related to green technology have increased significantly in recent years, the momentum of innovation must be stimulated in order to achieve the objectives of reducing greenhouse gas emissions (1.1.).

This need to accelerate research can take two main approaches, the first consisting of "liberalising" research by reducing, even eliminating, the protection on green inventions through the patent system. This approach looks to be unsuitable, since it is predominantly private companies who currently invest in research, who, by their nature, provide investment with the ultimate aim of making a profit (1.2.). Rather, it is the reinforcement of intellectual property which ought to encourage businesses to invest further in researching green technologies (1.3.). The question then is knowing if these green inventions or green patents should be subject to a special system, following the example of pharmaceutical patents.

1.1. The shortfall in the development of green innovations in spite of a boom since the end of the 1990s

The best indicator of the strength of innovation is the number of patent applications being submitted, even if an invention is not necessarily subject to a patent application submission, especially when the invention is kept secret.

Until recently, green technologies have struggled to find widespread use. Renewable energies were only trivial in terms of total energy production. The majority of innovations were made in the 1970s and 80s and only arrived on the market thirty years later.

Still, patent application submissions in the field of renewable energies remained consistently low until the end of the 1990s.

This situation changed at the end of the 1990s.

The development of green innovations since the year 2000

In 2009, INPI recorded 5,000 patent application submissions relating to green technology, comprising 37% of all submissions[9].

In 2009, the three fields of managing energy consumption, energy production and pollution management amounted to 15% of submissions, compared with 7% in 2000[10].

Between 2000 and 2009, applications associated with solar energy production multiplied by three (85 applications in 2009), those linked to wind or hydraulic energy by four (42 and 43 applications respectively in 2009), and those linked to alternative propulsion systems for means of transport by 2.5 (125 patents in 2009)[11].

Therefore, green technologies now represent an important part of innovation.

But the figures also demonstrate the limits of green innovation. In fact, in 2009, renewable energies were the subject of only 200 applications, even though that is three times more than in 2000. And yet the transition towards an economy based on low greenhouse gas emissions implies long term, on-going innovation. It is therefore essential that innovation in this field is promoted more vigorously.

But who should promote this? And how?

1.2. Private businesses, the key players in green innovation

Alongside government research, business-led research is the main driving force behind innovation. And yet due to the current economic crisis, it is difficult to imagine governments being in a position to mobilise large sums of money for research into green technologies. Therefore, in the next few years, the main focus for innovation must lie within private businesses.

To a business, research is an investment carried out with a view to making a profit.

Returns on an investment can be achieved in two ways:

- through a monopoly, which allows the sale of an innovative product or service which is distinct from its competitors' through innovation, which allows manufacturing costs to be reduced (a new faster, energy-saving process).
- through licences which can yield revenue.

[9] C. Ducruet, "Les technologies vertes concentrent un tiers des demandes", *Les Echos*, 23 March 2010, p. 10.
[10] INPI, Rencontres de l'innovation, 4 February 2010
[11] Generally speaking, the transport sector is dominant, as it represents 60% of "eco-innovations" (fuel-cell power, LED, etc.). The aviation industry has agreed to reduce its greenhouse gas emissions by half from now until 2050 in comparison with 2005. As part of the development of the A380, Airbus submitted several "green" patents, for example an assembly process to make a wing box made from carbon fibre composite. A quarter of the A380 is made from composite materials, which has allowed a weight saving of about 15 metric tons. J. Bowman, "Innovation, environnement et avenir", *Magazine de l'OMPI*, April 2010

Nevertheless, according to some economic analyses of patent law, a monopoly would not be the only way to promote innovation. Rewards, recognition, etc. could be an alternative in some effective instances[12].

It seems then that we must draw a distinction between the inventor as a natural person on the one hand, and the business on the other. It is probably quite true that salaried inventors are likely to be swayed by such rewards. For them, the financial appeal of invention is often not the primary attraction, though this may be because the level of additional earnings given to salaried inventors are rarely high.

On the other hand, to a business, the financial investment of research and development must be profitable, meaning that it must yield more than it cost. To a business, the return on an investment requested by the shareholder is the main driving force behind the investment.

In conclusion, the first challenge, namely that of promoting green innovation, is to be achieved more *a priori* through the reinforcement of intellectual property rights rather than their relaxation.

The risks linked to relaxing intellectual property rights

Some favour a conflicting policy, consisting of relaxing, even abolishing, patent rights on green innovations so as to encourage their free distribution around the world[13]. Some analogies with open source software are also put forward on occasion.

This stance seems to present certain dangers, for two reasons.

On the one hand, the parallel with open source software is not particularly convincing. First of all, we must remember that the open source system (which consists of the author of a particular piece of software (or part of software) releasing their software and authorising third parties to reproduce, modify and use it) cannot be viewed as some form of waiver of the intellectual property rights. On the contrary, it is a special manner of the author exercising his property right by authorising third parties to carry out certain acts (for example the modification) and prohibiting certain others (attaching licences to the modified software in return for payment). The so-called *creative commons* licences are a variant of this[14].
This system applies perfectly to patented inventions. But there is little chance of truly promoting green innovation. Indeed, the majority of free software hypotheses emanate from isolated authors or small groups of computer specialists. Instances where private businesses put these ideas forward are far more rare.

[12] C. Henry, "Développement durable et propriété intellectuelle. Comment l'Europe peut contribuer à la mise en oeuvre des ADPIC", *in Droit et économie de la propriété intellectuelle*, edited by M.-A Frison-Roche and A. Abello, LGDJ, 2005, p. 223-238.
[13] For a critique of the traditional justifications for intellectual property rights and in particular the stimulation of innovation in the field of new technologies : C. Oguamanam, "Beyond theories: intellectual property dynamics in the global knowledge economy", *Wake Forest Intellectual property Law Journal*, 2009, p. 104 *in particular* P. 117.
[14] The *creative commons* licences consist of making intellectual works out of communal property by relying on the consent of the author authorising the free use of his work and renouncing the right to receive any form of payment. The lack of payment requirements is therefore chosen by the author. S. Dussollier, Les licences Creative Commons: les outils du maître à l'assaut de la maison du maître, *Prop. intell.*, January 2006, p. 19.

And yet in the field of green technologies, the majority of innovations are made by teams of employees working in the laboratories of private businesses. As such, it is wishful thinking to hope that these green innovations might be the work of private inventors who wish to contribute them to mankind.
Of course, this system coupled with a large-scale government research body could prove effective. But public deficits are a significant disincentive to such a policy. And besides, there is nothing to stop the government service from potentially granting free licences to its patents[15].

On the other hand, the proposal of waiving the intellectual property and patent law as a result of the exceptional and dramatic nature of the risks of climate change presents a certain danger. Indeed, there is now something of a decline in the (admittedly imperfect) effectiveness of patent law in stimulating innovation. However, there is no contemporary example of an alternative legal system to effectively stimulate innovation. The new system, under which there would no longer be any appropriation of inventions through patents, would therefore be completely untested in our modern developed economies. As such, we would need to risk failure in adopting a new and unknown system.

It would seem then that this would be taking too great a risk in terms of the issues facing us. It would be preferable to depart from the existing patent model, perfectible though it may be, and amend its application so as to stimulate innovation in the sector of green technologies specifically.

1.3. Methods of stimulating green innovation: would a special system for green inventions be appropriate?

The potential adaptation of the current patent system with a view to encouraging investment in green technologies poses the question of the suitability of creating a special system for green inventions.

The characteristics of this special system could be focus on four aspects:
- the reinforcement of protection (a);
- the amendment of patentability conditions, in particular in inventive activity (b);
- the acceleration of the patentability examination process (c);
- the creation of databases so as to facilitate the work of applicants and leading players in the field (d).

a) The reinforcement of protection for green inventions: a theoretically limited effect on innovation

Intellectual property and more particularly invention patents as stimulants for innovation have been subject to several studies in economics[16].

[15] Needless to say, difficulties can arise if the invention is made in partnership with a private business.
[16] E. Mackaay and S. Rousseau, *Analyse économique du droit*, Dalloz, 2008, p. 302-325 which compiles the different theories.

Whereas the majority of economists recognise that intellectual property has a positive effect on innovation, the reinforcement of this protection has certain limits since *"the reinforcement of these rights will end up having a harmful effect on innovation, given that they will interfere with derivative innovation. And yet all innovation banks on existing knowledge"*[17].

Several studies seem to demonstrate that in those countries in which there is already strong patent protection, the reinforcement of this protection has practically no additional stimulating effect[18].

Furthermore, it results from these analyses that the considerable scope of a patent can be justified when the cost of innovation is higher than the cost of imitation. This is particularly the case in the pharmaceutical industry.

Conversely, some economists consider that the protection must be far less comprehensive, particularly as[19]:

- there are few substitute products;
- invention is relatively inexpensive to carry out;
- other incentives may encourage innovation, such as academic prizes.

In the field of green technologies, if a reinforcement of the monopoly conferred by a green patent is to be envisaged, there are essentially two approaches available: a extension of the duration of the monopoly or an extension of the scope of protection.

But upon analysis, it does not appear that the conditions highlighted by economists have been met for an impulsive reinforcement of intellectual property to be able to provide a strong incentive to innovation, and there are several reasons why this is the case[20].

- Firstly, in the field of green technologies, the investments necessary for developing and refining a particular technology are indeed high, but are nonetheless accessible to a large number of businesses.
Indeed, whereas it is true that the majority of patents in these fields are held by multinational businesses, the fact remains that the level of investment is indeed lower than that of the pharmaceutical industry and businesses operating on a national scale, and more and more small and medium-sized businesses are investing in these green technologies and submitting patents[21].

[17] E. Mackaay and S. Rousseau, *op. cit.*, n°1107
[18] See the studies of J. Lerner, "150 years of patent protection", *American Economic Review Papers and Proceedings*, 2002, p. 221-225; W. Landes and R. Posner, *The economic structure of intellectual property law*, Cambridge, MA, Belknap of Havard University Press, 2003; A. Tabarook, "Patent theory versus patent law", *Contribution to economic analysis and policy*, 2002, 1-24. For a summary of these studies: E. Mackaay and S. Rousseau, *op. cit.*, n°1116
[19] C. Henry, "Développement durable et propriété intellectuelle. Comment l'Europe peut contribuer à la mise en oeuvre des ADPIC", *in Droit et économie de la propriété intellectuelle*, edited by M.-A. Frison-Roche and A. Abello, LGDJ, 2005, p. 223-238, *in particular* p. 238.
[20] On the increase of the duration of protection in return for giving up the exclusivity of the title, see below, p. 20.
[21] J. Reichman, A. Rai, G. Newell and J. Wiener, *Intellectual Property and Alternatives : Strategies for Green Innovation*, report 08/03 Chatham House, December 2008, p. 17.

- Secondly, in this field, many patents have already fallen into the public domain[22].

- Finally, for each product, there are often alternative or substitute technologies available[23].

- It is also important to note that currently, the patent system in France and Europe offers considerable protection to patent applicants.

As such, if we accept the results of the various studies on the economics of invention patents and their impact on innovation, we arrive at the conclusion that a reinforcement of the monopoly on green inventions would have little or no effect on innovation in this field.

b) The relaxation of patentability conditions: a solution to be ruled out

- Some practitioners propose redefining the patentability criteria for inventions in the field of green technologies, in particular the condition of inventive activity which, when defined negatively, is fulfilled if *"for the tradesman, it* (the invention) *does not obviously stem from the state of the art"*[24].

Some known technologies developed in the past have never been used for their positive effect on the environment for the sole reason that at the time, there was no demand for such technological effects.

The question therefore arises of if the application of known technologies used to reduce greenhouse gas emissions should fulfil the conditions for patentability.

The new application of known methods is defined as follows by Pouillet: *"to apply something in a new way is purely and simply the use of known methods in the manner for which they are known, without even modifying anything aspect thereof, to derive a different result from that which they had produced until then"*[25]. Is it possible for the condition of inventive activity to be fulfilled when the known method bears the same function and produces the same result as in its previous applications?

French case law suggests not, and considers that when the new application is equivalent to the former application and that the resolved problem had already arisen, there is no inventive

[22] E. Derclaye, "Not only innovation but collaboration, funding, goodwill and commitment: which role for patent laws in post-copenhagen climate change action", *John Marshall Review of Intellectual Property Law*, 2010, p. 658.

[23] The existence of substitute technologies is the reason why the WTO has not to this day actively examined this issue specifically, unlike the healthcare industry, in which there are often no substitute products. J. Reichman, A. Rai, G. Newell and J. Wiener, *Intellectual Property and Alternatives: Strategies for Green Innovation*, report 08/03 Chatham House, December 2008, p. 18 (photovoltaic energy).

[24] Article L. 611-14 CPI. K. Luzzato, "Patents can help the environment", *IP World*, September 2008, p. 6-9. The notion of inventive activity is precisely defined but its implementation is subjective and can vary from one examiner or judge to another and from one technology to another.

[25] Pouillet, Traité des brevets d'invention et de la contrefaçon, 1899, n° 31, p. 46. However, the new combination of known methods *"consists of bringing together methods which had not previously been united in the same way with a view to making them produce a result together"*, J. Azéma and J.-C. Galloux, *Droit de la propriété industrielle*, Dalloz, 6th edition, 2006, n°238.

activity[26]. It is only when the method fulfils a new function which it did not previously fulfil, or even when the new application of the method was only known in an unrelated technical sector that the invention is patentable[27].

This solution is important, as in the field of green technologies numerous known technologies have been re-used in new applications and the known method does not always fulfil a new function.

- To overcome this difficulty, some practitioners have therefore proposed the creation of a new category of inventions: inventions which have a second effect for the environment[28].

The idea is to patent those inventions which consist of exploiting old, known technologies so that they can be applied to green inventions which protect the environment.

Thus, the act of modifying a product so as to make it less pollutant could fall under inventive activity, not unconditionally of course, even if the proposed solution, without it being entirely obvious, could have been discovered by the original inventor. In other words, it would be a case of reducing the patentability threshold through the more liberal application of the condition of inventive activity[29].

This option could prove to be a strong incentive to research in the field of green technologies.

But it presents the risk of multiplying applications for patents on relatively obvious adaptations of products or processes to make them less emissive. In addition, one can doubt the necessity of such a measure to accelerate green innovation. Indeed, it is highly possible that these modifications could be made without resorting to intellectual property, in particular if the most emissive products are subjected to higher taxation, or even if the "clean" nature of a product becomes a real selling point.

In conclusion, it appears that a modification of the requirement of inventive activity is not justified due to the risk that patent offices will be overwhelmed with applications and that the number of legal disputes will multiply, and above the fact that the main stimulus for these relatively simple and inexpensive modifications will be the market.

[26] J. Azéma and J.-C. Galloux, *Droit de la propriété industrielle*, Dalloz, 6th edition, 2006, n°291. The same solution seems to exist in English law : J. Reichman, A. Rai, G. Newell and J Wiener, *Intellectual Property and Alternatives : Strategies for Green Innovation,* report 08/03 Chatham House, December 2008, p.16.
[27] P. Mathély, *Le nouveau droit français des brevets d'invention,* LJNA, 1991, p. 108.
[28] K. Luzzato, "Patents can help the environment", *IP World,* September 2008, p. 9.
[29] It has also been proposed that the national offices of countries in which the description alone is a condition of patentability no longer check this condition. V.E. Derclaye, "Not only innovation but collaboration, funding, goodwill and commitment: which role for patent laws in post-copenhagen climate change action", *John Marshall Review of Intellectual Property Law*, 2010, p. 659-660.

c) The acceleration of the examination processes for patent applications relating to green technologies

- One method which is probably more effective at encouraging businesses to invest in green technologies is to guarantee that industrial property titles will be issued faster.

The incentive could come from accelerated examination processes, since they allow the faster marketing of a technology which also favours the granting of licences.

- Australia, the United States, South Korea and Great Britain have already implemented such procedures[30].
The USPTO, the American patent office, has announced a pilot programme for green technologies. This programme, available to the first 3,000 applications for patents on green technologies, aims to accelerate the examination stage for patent applications.
This system was also implemented in May 2009 in the United Kingdom under the name of *Green Channel*. The director of the English patent office indicated that the period of time between submission and granting the patent has been reduced to eight or nine months instead of the customary three to five years[31]. In October 2009, 65 applications had been filed with the British patent office under the accelerated system.

Brazil, China and Japan have each declared their interest in this system.

The desirable situation would be for the EPO to propose such a programme, as the widespread implementation of this system would in all likelihood encourage investment in this field.

d) The creation of databases so as to facilitate the work of applicants and leading players in the field

- Green technologies cannot be categorised using any of the traditional technical categories. Research efforts in these fields have been relatively recent and the number of patent applications has been witnessing significant growth over the past decade. It is therefore difficult for a business to determine precisely which technologies are protected by patents, and which are in the public domain. This may prove to be a barrier to investment.

- In order to overcome this difficulty, in May 2010 the EPO (European Patent Office) announced the forthcoming launch of a new database gathering together some 600,000 patents relating to clean energy, which have been selected from the 60 million documents held by the EPO.

The EPO established a typology of 160 categories, such as carbon capture or photovoltaic cells. This database allows us, for any given technology, to immediately ascertain which patents have been filed and the identity of their owner.

[30] E. Derclaye, "Not only innovation but collaboration, funding, goodwill and commitment: which role for patent laws in post-copenhagen climate change action", *John Marshall Review of Intellectual Property Law*, 2010, p. 659 and 661.
[31] J. Bowman, "Innovation, environnement et avenir", *Magazine de l'OMPI*, April 2010.

- The flexibility of information for each technology is a useful tool, particularly for small and medium-sized businesses which have more limited means, among other things for the conduct of anteriority research and studies into freedoms to operate. And yet dynamic businesses in the field of green technologies are often of a reduced size and growing importance.
The think-tank *Chatham House* analysed patents falling under six energy categories: wind, photovoltaic, solar concentration, biomass, carbon capture, and clean coal[32]. Needless to say, it transpires from this that multinational companies hold the majority of patents in these six fields. But the second category of holders is made up of national businesses with more than 250 employees. And small and medium-sized businesses are often very active in this domain: in the field of wind energy 5 to 10% of patents are held by small to medium-sized businesses[33].

Furthermore, this information is becoming all the more important as numerous technologies have fallen into the public domain. An analysis of the 30 most cited American patents in the field of green energies demonstrates that the vast majority of them have fallen into the public domain[34]. It is therefore crucial that major economic players precisely distinguish the technologies covered by a monopoly from those which are free, in particular so that research can be directed accordingly.

- The creation of this database also presents other advantages.
On the one hand, it assists the emergence of a vocabulary which is common to each green technology, which will facilitate the work of applicants and all those involved in these fields.

Ultimately, this database can encourage agreements between holders of complementing patents, cross-licenses, partnership projects, and bilateral or multilateral research.

It is difficult to predict the influence of this initiative, one which is to our knowledge previously untested, but we can be certain that it will assist in reassuring those businesses which invest in this field, which can only serve to promote innovation.

Other courses of action not affiliated with intellectual property

However, governments possess numerous tools to encourage the transition towards a green economy aside from intellectual property[35].

The three main instruments are (i) the publishing of restrictive standards on emissions (the CO2 emissions of vehicles), (ii) targeted taxation (carbon tax in France was not adopted in the end following the vote on the law dubbed *Grenelle II* in Spring 2010) or even (iii) the market system of quotas adopted in the Kyoto Protocol in 1997 and by the European Union Emissions Trading Scheme (EU ETS)[36].

---

[32] B. Lee, L. Lliev and F. Preston, *Who owns our low carbon future ? Intellectual property and energy technologies*, Chatham House, September 2009.
[33] *Ibid.*, p.13-14, 17.
[34] *Ibid.*, p. 48. J.H. Barton, "Brevets et accès aux technologies énergétiques propres dans les pays en développement", *Magazine de l'OMPI*, February 2008, p. 6.
[35] For a list of measures undertaken by the American government to promote green technologies see : J. A. Herrick, "Federal project financing incentives for green industries: renewable energy and beyond", *Natural Resources Journal*, 2003, p. 77.
[36] C. de Perthuis and S. Shaw, "Normes, écotaxes, marchés de permis: quelle combinaison optimale?", *in L'économie verte*, Cahiers français n° 355, March-April 2010, La Documentation française p. 49-54.

Essentially, government investment in research into green technologies, the distribution of the results of such research projects (free licences) to all major players, and partnerships between large research centres around the world (universities, *Grandes Ecoles*, institutes, etc.) are evidently conducive to promoting innovation, but as indicated, the budgetary situation of many states certainly does not permit such investment.

There are therefore possible improvements to be made to the current patent system in order to promote green innovation in private businesses. But it does appear that overly radical amendments, such as the modification of patentability conditions, would risk exerting a counterproductive effect.

2. The need to promote the distribution of green technologies: giving priority to incentives

The second challenge is the distribution of green technologies, that is their use on a large scale. This distribution must be quick, far-reaching and apply to a very wide range of products and services.

The first issue is knowing if, in the past, the distribution of technologies from the energy field has been rapid enough to combat the current challenges. These problems impose a very tight schedule in terms of reducing greenhouse gas emissions (2.1.).

Upon analysis, it appears that the rate of distribution of green technologies has proven insufficient up to now in overcoming the current challenges. We need to introduce systems which are both voluntary, such as patent communities or the reduction of customs duties (2.2.), and, on a additional level, those which are more coercive, such as non-voluntary licences (2.3.).

2.1. The need to accelerate the distribution of green technologies

The distribution of a particular technology is difficult to measure. Partnerships between businesses or with governments as well as patent licences or know-how licences are not always made public. Admittedly, patent licences are often published so that they can be legally binding against third parties, but their content may remain confidential. Besides, not all licences are published and the same applies to know-how transfer contracts.

The institute *Chatham House* evaluated the length of time taken for inventions in the energy sector to be distributed. They noticed that these inventions on average take 20 to 30 years to arrive on the mass market and become commonplace in subsequent inventions[37]. Those inventions which fall under the six technology sectors associated with reducing carbon emissions show an interval of approximately 24 years[38]. The institute concluded from this study that the distribution time for green technology must be halved in order to stand a chance of achieving the fixed objectives with regard to climate change[39].

[37] B. Lee, L. Lliev and F. Preston, *Who owns our low carbon future ? Intellectual property and energy technologies*, Chatham House, September 2009, p. vii
[38] *Ibid.*, p. vii and 48.
[39] *Idem.*

2.2. Voluntary tools to accelerate the distribution of green technologies

Patent pools or patent communities are a near-unanimously recognised factor in the distribution of technologies (a). Their success depends on the number of participating businesses and the patent portfolio which the community possesses. An avenue of thought to encourage businesses to join to patent communities would be to increase the duration of protection for patents contributed to a pool, the exclusive rights to which have already been waived by the patent holder (b).

a) Patent pools

Patent pools attract particular interest when a multitude of complementing patents covering a *technology platform* belong to several holders. Once the pool has been created, its members as well as third parties are able to access the whole portfolio of patents under fair, reasonable and indiscrimate conditions, given that the licences are non-exclusive as a result. The interest in communities also lies with the effect of standardising products or even the effect of complementarity.

Standardisation consists of adopting common technical standards for products proposed by competing businesses. In a small minority of cases, it can limit innovation by blocking the incorporation of new technologies. But in the majority of cases, standardisation accelerates innovation and the distribution of a technology. The existence of patent communities is often associated with the necessity for leading players in the field to guarantee the compatibility of their technologies and their products.

Thus, in the field of mobile telephony, the majority of patent holders, including small and medium-sized businesses, are compensated through a highly evolved system of standardisation which, in theory at least, offers access to all entrants[40].

A innovative green community: Eco-patent commons

- In February 2008, IBM launched a patent sharing system which was seen as beneficial to the environment under the aegis of the World Business Council for Sustainable Development (WBCSD). Among others, the members of this community include IBM, Nokia, Sony, Dupont, Xerox, and Bosch.

The aim of this community was to share knowledge and patents which bring a direct benefit to the environment or allow a reduction in energy consumption, i.e. those which fall under the fields of energy saving, pollution prevention, recycling, or water conservation[41]. Nokia, for example, introduced a patent to the community for recycling mobile telephones.

[40] ETSI plays a major role in counting patents and issuing licences for patents belonging to its members. Difficulties are still ongoing with regard to the necessity of concluding contracts for cross-licenses and on royalty rates. Another patent pool is the *Electric Power Research Institute* (EPRI) whose role is facilitate communications between the different development services of large American businesses in the sector. The patent pools scheme has also been developed in the field of MPEG-2 compression software.

[41] The list of patents is available on the site www.wbcsd.org. See in particular : J. Reichman, A. Rai, G. Newell and J. Wiener, *Intellectual Property and Alternatives : Strategies for Green Innovation*, report 08/03 Chatham House, December 2008, p. 21.

Each participating business as well as any third party has free access to this and no registration or notice is required to use the community's patents.

The limit to this patent community lies in the number and above all scope of patents contributed to the community. In fact, the members recognise that they most often contribute patents which are not seen as strategic to the business and which are not especially profitable[42].

Besides, patent communities mainly attract interest when patents on a particular technology (GSM mobile telephony, then 3G, MPEG format, etc.) are held by different holders. In the field of green technologies, in order to be effective, the patent communities should each concentrate on one particular technology: wind, solar energies, carbon capture, etc..

In the field of green technologies, patent communities must receive encouragement from incentive schemes, in particular by offering rewards when the exclusivity on patents is waived.

b) Voluntarily waiving exclusivity

At the heart of the most industrialised countries, one of the main barriers to the distribution of innovations is the monopoly status conferred by the patent.

This monopoly is the essence of the patent. Requiring the holder of a patent to waive his exclusivity to this right may only be done when special circumstances require it. But the idea of encouraging patent holders to voluntarily waive their exclusivity to their title could be considered. This incentive would be applied first in patent communities since the patent holder waives exclusivity by accepting that multiple licences will be issued.

One significant incentive could be increasing the duration of the patent, inasmuch as the patent holder would collect royalties over a longer period.

It is difficult to evaluate the motivational effect of such a measure.

Of course, studies show that the majority of patents are not kept in force until their expiry because they are considered to be of limited interest or not profitable enough. But those patents which exhibit significant technical progress and do not become obsolete due to subsequent inventions are used and kept in force until they expire.

[42] J. Bowman, "Eco-patent commons pour un partage des brevets écoresponsible", *Magazine OMPI*, June 2009, n°3, p.11 and 12.

In order to appreciate the pertinence of such an incentive, it would be useful to carry out a potential survey among applicants. This survey would also enable us to evaluate the additional duration needed on the validity of the patent for this to serve as an incentive.

Another means to distribute outside of intellectual property: the removal of customs duties on "green" products

The major issue discussed in the WTO with regard to trade and the environment is that of eliminating customs duties and non-tariff barriers for environmental products and services.

But until now, the essential difficulty which has thwarted the adoption of any resolutions is the definition of environmental goods and services[43].

2.3. Instruments to coerce the acceleration of green technology distribution

The compulsory licence is a means through which a third party has access to a technology covered by a patent monopoly without its owner having given his consent.

The compulsory licence transforms the monopoly of the owner into a simple right to receive remuneration. Needless to say, the compulsory licence does not deprive the patent right of its substance because the owner retains the faculty to collect revenues and maximise returns on his investment. But it strips the industrial property right of its ability to exclude its competitors and the possibility of implementing a strategy for issuing licences.

It is therefore only when an essential public interest is at stake that the principle of compulsory licences can be justified.

The challenge of reducing greenhouse gas emissions presents sufficient stakes to warrant the consideration of such an encroachment of a property right in exceptional circumstances.

But the difficulty arises from the fact that any cut in patent prerogatives runs the risk of discouraging or even obstructing investment in the field of green technologies.

Compulsory licences are commonplace in intellectual property law. This system could be adapted to green technologies (b).

[43] See situation reports for October 2009 and April 2010 from the Agency for International Trade Information and Cooperation (AITIC). Another factor in the distribution of new technologies and in particular know-how is the fluidity of the labour market and the movement of inventors from businesses to others. Occupational networks also favour business partnerships.

a) Involuntary licences, a common tool in intellectual property law

Involuntary licences are used in circumstances which prove that a greater interest prevails over that of the patent owner. There are numerous theoretical cases in the Intellectual Property Code, but instances where patent law has been applied in practice are very rare.

- In intellectual property law, the largest and most well-known legal licence from an economic perspective involves the music industry. Music producers and performers are the owners of a related right to copyright which grants them the monopoly of authorising or prohibiting the use of their performance/sound recording. Encroaching upon this exclusive right, article L. 214-1 of the Intellectual Property Code states that producers and performers may not oppose the radio broadcasting or simultaneous and integral cable distribution of this sound recording[44]. In return, they receive a remuneration called "equitable remuneration" which is collected from music broadcasters (radio stations) and shared among collective licencing bodies (the Society for the Collection of Equitable Remuneration, SPRE).

- But it is in patent law that the theories of compulsory licences are the most numerous, even if the provisions are practically never applied.

Administrative licences

- The *ex officio licence in the interest of public health* allows the Government to bypass the agreement of the patent holder[45]. This mechanism may only be implemented if no amicable agreement was able to be made with the patent holder. But the reasons for enforcing the compulsory licence are numerous: the quantitative or qualitative insufficiency of medicines, as well as abnormally high prices or even conditions to reduce competition.
This text, to our knowledge, has never been enforced. Nonetheless, we cannot definitively conclude on its ineffectiveness for on the one hand there is an inclination to only enforce it in exceptional instances and, on the other, it acts as a deterrent and facilitates conflict resolution[46]. However, it must be noted that this compulsory licence is not free.

---

[44] Article L. 214-1 of the Intellectual Property Code states that: *"When a sound recording has been published for commercial purposes, neither the performer nor the producer may oppose: 1) Its direct communication in a public place where it is not used for entertainment; 2) Its broadcasting or the simultaneous and integral cable distribution, as well as its reproduction exclusively for these purposes, made by or on behalf of audiovisual communication companies with a view to broadcasting their own programmes using their antenna as well as those of audiovisual communication companies who pay equitable remuneration.*
In all other instances, it is the responsibility of the producers of said programmes to comply with the exclusive right of the owners of the related rights set forth in articles L. 212-2 and L. 213-1.
Such uses of sound recordings published for commercial purposes, whatever the place of fixation of these sound recordings, shall entitle the performers and producers to remuneration.
Such remuneration shall be paid by the persons who use the sound recordings published for commercial purposes under the conditions set forth in items 1 and 2 of the present Article.
It shall be based on the revenue from use or, failing that, calculated as a lump sum in the cases set forth in Article L131-4.
It shall be shared half each between the performers and the sound recording producers". V.A. and H.-J. Lucas, *Traité de la propriété littéraire et artistique*, Litec, 3rd ed., 2006, n° 1056-1070.
[45] J. Larrieu, "La propriété intellectuelle et le droit à la santé", *in La propriété intellectuelle, entre autres droits*, edited by J.M. Brugière, Dalloz, 2009, p. 15 s. Articles L. 613-16 and L. 613-17 are reproduced in Annex 3.
[46] A. Abello, *La licence, instrument de régulation des droits de propriété intellectuelle*, LGDJ, 2008, n°409.

This compulsory licence presents the advantage that the conditions governing its application are far-reaching: a simple quantitative or qualitative *"deficiency"*, but also abnormally high prices.

- The *ex officio licence in the interest of economic development* refers to a hypothesis of the patent holder who does not exploit his patent sufficiently or at all to meet the needs of the national economy[47]. The Government may then impose an ex officio licence granted to a third party in return for the payment of royalties. In relation to the ex officio licence on health grounds, an abnormally high price is no longer a criteria which permits its enforcement.

Judicial licences

- The *compulsory licence for failure to exploit* allows any individual who can demonstrate that he is in a position to exploit an invention in an effective and serious manner to request that the judge grant him the patent licence if its holder is not exploiting of the invention or has not undertaken serious preparations for a period of three years from the date of issue or four years from the date of submission[48].

This compulsory licence applies to all inventions.

- However, the *dependent licence* allows an inventor to obtain, in return for remuneration, a licence from the previous patent holder if the use of his invention incorporates the invention covered by the previous patent (in most cases, improvement), on the condition that the second invention presents *significant technical progress* and *considerable economic interest*. This mechanism thereby facilitates the creation of a chain of innovations[49].

- The final basis which allows a compulsory licence to be issued is competition law, and more particularly the abuse of a dominant position. In fact, both EC and national case law consider that in certain *exceptional circumstances*[50], intellectual property rights can constitute essential infrastructures and that the refusal to grant a licence to intellectual property rights could constitute an abuse of a dominant position, justifying the issue of a judicial licence by way of sanction[51].

[47] Articles L. 613-18 is reproduced in Annex 3.
[48] Articles L. 613-1 and L. 613-12 are reproduced in Annex 3.
[49] Article L. 613-15 is reproduced in Annex 3.
[50] The refusal to issue a licence may only constitute abuse in *"exceptional circumstances"* since the licence holder's monopoly aims above all to confer an exclusive right. See Court of Justice of the European Union, 6 April 1995, *aff. Magill*, Rec. CJEU, I, p. 743.
[51] See for example : A. Abello, *La licence, instrument de régulation des droits de propriété intellectuelle*, LGDJ, 2008, n°443, et seq.. J. Azéma and J.-C. Galloux, *Droit de la propritété industrielle*, Dalloz, 6th edition, 2006, n°550 et seq..

b) Non-voluntary licences, a useful tool for the distribution of green technologies

Among the mechanisms for compulsory licences, the grounds applicable to green technologies are (i) the ex officio licence in the interest of economic development, (ii) the compulsory licence for failure to exploit a particular patent, (iii) the dependent licence, and (iv) the compulsory licence as a remedy to an anti-competitive situation.

Thanks to the comprehensive nature of the law, competition law presents the advantage of its flexibility and applicability to a wide range of situations. But the current provisions seem to be insufficient. In fact, the conditions set forth by case law for the granting of a judicial licence are strict, for it offers an exception to the monopoly held by the patent holder. EC and national jurisdictions consider that the refusal to grant a licence can constitute abuse of a dominant position when (i) the patent holder is unable to offer an *"objective justification"* of his refusal to authorise the licence, (ii) his refusal is obstructing the emergence of a new product on the market, and (iii) his refusal prevents any competition on the market, *i.e.* there are no substitute products or services. And yet the notion of *"objective justification"* is not really defined by case law[52]. In every case, the judge must balance the interests of each party in order to settle the case.

For these reasons, it would be desirable for a special text applicable to green technologies to be established so as to have a declaratory effect highlighting the importance of the subject so that the conditions for compulsory licencing can be more clearly defined.

Product or process patents for green technologies could therefore be incorporated into the compulsory licence system in the interest of protecting the environment (i) when the patented products (or products derived from patented processes) are made available to the public in insufficient quantities or qualities or at abnormally high prices, (ii) when the patent is used in conditions which run contrary to the interest of protecting the environment, or even (iii) in conditions which constitute practices deemed as anti-competitive following an administrative or jurisdictional final verdict ruling.
It would be desirable for this compulsory licence to be granted either by the administration (the Ministry in charge of the environment and possibly the Ministry in charge of the economy) or the judge invoked by a third party who can demonstrate the desire and ability to manufacture and market a product covered by the disputed patent. Such a mechanism could assist in complementing the distribution of green technologies, all the while protecting the rights of patent holders.
Furthermore, the dependent licence should find its scope in green technologies as the notions of significant technical progress and considerable economic interest should be assessed against the yardstick of the challenge of reducing greenhouse gas emissions.

As such, accelerating the distribution of green technologies should be able to be made possible through measures which serve both as an incentive, in particular patent communities and perhaps a system for voluntarily waiving exclusivity in return for an increase in the duration of protection for the invention, but also through more coercive measures such as the compulsory licence which should evidently remain a subsidiary regulation, when it appears that the distribution of a key technology is paralysed by the execution of a patent right.

[52] F. Siirainen, "Propriété intellectuelle et concurrence. Problématique de la convergence", *in La propriété intellectuelle, entre autres droits*, edited by J.M. Brugière, Dalloz, 2009, p. 31, *in particular* p. 43 et seq..

3. The pressing need to allow the transfer of green technologies to developing countries

The issue of transferring technology is very close to that of distribution but is no longer on a national or regional scale, but rather a global scale. The challenge is one of ensuring that green technologies can be used not only in western, developed countries but also in other poorer parts of the world: developing countries.

For example, a new generation of wind turbine is invented by a French company. It holds patents in Europe, the United States, Japan, China, Mozambique and Brazil. If the French company has sufficient production facilities or indeed if it grants manufacturing and marketing rights to developed countries, the distribution of this technology should be effective in these countries. On the other hand, the prices charged could prove to be very indeed too expensive for the Chinese, Brazilian and Mozambican markets. If the French company refuses to reduce (or cannot reduce) its prices, in particular because the manufacturing costs for the turbine in France are too high, some countries may not be able to access this technology.

In this hypothesis, intellectual property is a barrier to the transfer of technology to developing countries. The problem is finding a legal solution which allows this transfer from a legal perspective.

Stances vary on this matter. A certain number of developing countries are calling for an "openness" of green technologies and are advocating free access to these technologies in order to fulfil the transition to an economy which is respectful of the environment. The developed countries who are at the origin of the majority of patent submissions oppose this solution (3.1.).

How are we to reconcile the interests of those countries submitting patent applications and developing countries? How should the negotiations be conducted?

In intellectual property law, there is one precedent, that of medical patents. The solutions which have been found may prove to be a source of inspiration for green technologies, we cannot justify this with an analogy given that the situations differ (3.2.).

There are other mechanisms in place, in particular in the TRIPS Agreements, which allow a transfer of technology even in the absence of agreement from the patent holder (3.3.).

3.1. Conflicting positions on the means to guarantee the transfer of green technologies to developing countries and the absence of a single negotiations framework

The position of the majority of developed countries differs greatly from that of a large number of developing countries (a).

These differences of opinion are accentuated by the fact that international negotiations on matters of the environment and intellectual property are currently taking place within two different frameworks: on the one hand under the WTO and, on the other, under the United Nations. This fragmentation of negotiations is detrimental and it would be desirable for the subject to be discussed at one level alone through the creation of a world environmental organisation (b).

a) Conflicting positions on the question of the role of patents in the transfer of green technologies

The first stumbling block between developed countries and developing countries during international negotiations is that of sharing efforts to reduce greenhouse gas emissions with regard to the current situation as well as those emissions originating from developed countries in the past.
According to estimates, developed countries are responsible historically for 77% of the total emissions since the middle of the 18th Century. Today, the situation is different since, in 2004, developed countries were responsible for "only" 59% of emissions in 2004. In 2007, China became the leading source of emissions[53]. Sharing the effort to reduce emissions should therefore arbitrate between the "historical" responsibility of developed countries who now have the financial means to react to the challenge of green technologies and the developing countries who do not want to handicap their economic development but who, since 2007, have been contributing to the majority of emissions.

- In the context of international negotiations, developed countries consider by and large that we ought to retain the current patent system since the relaxation of patents would discourage research. This position is to be explained by the fact that the ten leading "green" patent holders originate from OECD countries (the United States, Germany, Japan, Denmark and South Korea), with the exception of China which is ranked fourth[54].

- As far as developing countries are concerned, they maintain that the issue demands the free distribution of technologies. They take their inspiration from specific provisions in the TRIPS agreements negotiated under the auspices of the WTO, which authorise, under certain conditions, a state to manufacture (or import) medical treatments protected by patents. This position is defended by the G77 countries[55].

---

[53] E. Laurent, "De Stokholm à Copenhague: les engagements internationaux et leur application", *in L'économie verte*, Cahiers français n° 355, March-April 2010, La Documentation française p. 40.
[54] B. Lee, L. Lliev and F. Preston, *Who owns our low carbon future ? Intellectual property and energy technologies*, Chatham House, September 2009, p. 14 et seq..
[55] G77 is a group gathering together roughly 130 developing countries who have formed an informal coalition in the context of United Nations negotiations. This group of 77 countries was created in 1964 in the context of the UNCTAD (United Nations Conference on Trade and Development). With regard to the transfer of technology and biodiversity, see : G. Ghidini, "Equitable sharing of benefits of biodiversity-based innovation: some reflections under the shadow of a neen-tree", *Italian Intellectual Property*, July 2002, p. 39-51.

- Upon examination, the issue of transferring technologies from developed countries holding significant "green" patent portfolios to developing countries does not apply across the board. It is important to define to separate categories of countries.

- On the one hand, there are emerging countries such as India, Brazil or China which are now major centres of innovation in the field of green technologies, some of whose companies are now listed among the 20 largest in the world[56]. In China the 11th and 12th plans hold environmental activities in high regard through the closure of the most highly polluting factories, water purification or even the promotion of the electric car[57].
- On the other hand, there are those struggling countries which have only a small chance of accessing green technologies if no special treatment is granted to them.

b) The break-up of the negotiating framework on the transfer of green technologies

1/ Historically, intellectual property has been negotiated at large international conventions such as the Paris Convention on industrial property in 1883 and the Bern Convention on copyright of 1886. These conventions have been amended on several occasions at international conferences.

2/ In 1994, upon the creation of the WTO, it was not clear that aspects of intellectual property would be discussed within this organisation.

The integration of intellectual property into negotiations on trade and the adoption of the TRIPS agreements was justified by the fact that the liberalisation of world trade required the harmonisation of intellectual property rights systems so as to avoid imbalances in competition[58].

The WTO has been taking an interest in the issue of the transfer green technologies but its interest is less active than that accorded to pharmaceutical patents as it believes that the problem does not essentially originate in intellectual property insomuch as there are very often substitute technologies and many technologies have already fallen into the public domain[59].

3/ The United Nations provides the third framework for negotiation.

The first United Nations conference on environment was organised in Stockholm in June 1972 and led to the creation of the United Nations Environment Programme (UNEP). Its greatest success is the Montreal Protocol of 1987 on the protection of the ozone layer by aiming to eliminate chlorofluorocarbons which are harmful to the ozone layer.

[56] B. Lee, L. Lliev and F. Preston, *Who owns our low carbon future ? Intellectual property and energy technologies*, Chatham House, September 2009, p. 57.
[57] J. Jurgensen, "Acteurs privés, pouvoirs publics, organismes internationaux: quels rôles?", *in L'économie verte*, Cahiers français n° 355 March-April 2010, La Documentation Française, p. 35.
[58] C. Henry, *"Développement durable et propriété intellectuelle"*, edited by M.-A. Frison-Roche and A. Abello, LGDJ, 2005, p. 223-238.
[59] WTO and UNEP report, *Trade and Climate Change*, 2009. E. Derclaye, "Not only innovation but collaboration, funding, goodwill and commitment: which role for patent laws in post-Copenhagen climate change action", *John Marshall Review of Intellectual Property Law*, 2010, p. 657-658.

This protocol is the only international agreement to have been ratified universally (196 states)[60].

In 1992 the first Earth Summit or *United Nations Conference on Environment and Development* (UNCED) took place, at which the *United Nations Framework Convention on Climate Change* (UNFCCC) or the *Climate Convention* was adopted, the aim of which was to stabilise greenhouse gas emissions.

In 1997, the Protocol to the Convention on Climate (Kyoto Protocol) was the first to establish quantifiable emission reduction commitments. 38 industrialised countries have committed themselves to a reduction in greenhouse gas emissions by at least 5% by 2012 in relation to 1990 levels. 107 developing countries only have an obligation to take stock of their pollutant emissions. This protocol came into force on the 16 February 2005.

In order to achieve these aims, *"flexible"* mechanisms have been defined to complement the national policies of each State: the trading of emissions allowances and, furthermore, a Clean Development Mechanism (CDM) which allows developed countries to acquire carbon credits in return for public or private investment in clean technologies in developing countries (article 12). These CDMs have accounted for 5.4 billion dollars in 2006 (508 million tonnes saved) and approximately 16 billion dollars of investment since 2002.

But the Kyoto Protocol does not directly tackle the issue of intellectual property rights.

In December 2009, the 15th Conference of parties to the Convention on Climate Change was held in Copenhagen. The parties did not succeed in reaching an agreement on binding commitments in terms of reducing emissions, and aspects of intellectual property were barely discussed in the Copenhagen Accord, above all because the European Union and the United States believed that issues relating to intellectual property did not need to be examined in the context of negotiations on climate changes as they are already being studied under the WTO[61].

Nevertheless, the Copenhagen Accord ratified the creation of *Technological Action Programmes "charged with accelerating the development and transfer of technologies in support of adaptation and mitigation measures"* (point 11). The organisation of these programmes should be negotiated at a later date. In the context of current negotiations relative to this organisation, the issue of intellectual property rights is the most debated alongside that of financing[62]. In particular, the idea of the organisation acquiring certain patents and then granting free licences to developing countries is being contemplated.

- In view of this relative failure, the idea of creating a World Environmental Organisation is being proposed more and more frequently. It would centralise all debates on green technologies and intellectual property rights. It remains to be seen what instruments could be used to encourage the effective transfer of technologies to developing countries.

[60] E. Laurent, "De Stokholm à Copenhague: les engagements internationaux et leur application", *in L'économie verte*, Cahiers français n° 355, March-April 2010, La Documentation française, p. 38-42.
[61] E. Derclaye, "Not only innovation but collaboration, funding, goodwill and commitment: which role for patent laws in post-Copenhagen climate change action", *John Marshall Review of Intellectual Property Law*, 2010, p. 657-658.
[62] WTO and UNEP, *Trade and Climate Change*, 2009, p. XV.

3.2. The precedent set by the pharmaceutical industry: an flawed source of inspiration for green technologies

Until a few years ago, the greatest debates in the context of international negotiations related to intellectual property and health issues[63].

These humanitarian issues are nonetheless different, even though the two basic problems of encouraging research and transferring technologies to developing countries do still arise in this field.

The difficulty ensues from the fact that some countries are neither able to manufacture these products nor purchase them as a result of their high price, which includes part of the initial research and development cost. As such, in the absence of differential prices, patents can make access to care difficult for underprivileged people[64].

The compulsory licences system set forth by article 31 of the TRIPS Agreements has provided one solution among others to this problem[65]. It was reaffirmed in 2001 as part of the Doha Declaration.

The Doha Declaration: the reaffirmation of flexible mechanisms to protect public health

At the DOHA Diplomatic Conference, on the 14 November 2001, members of the WTO adopted a special declaration on the TRIPS Agreements and public health.

This declaration aimed to recognise *"the gravity of the public health problems afflicting many developing and least-developed countries, especially those resulting from HIV/AIDS, tuberculosis, malaria and other epidemics"* (point 1). As such it stated that *"the TRIPS Agreement does not and should not prevent members from taking measures to protect public health. Accordingly, while reiterating our commitment to the TRIPS Agreement, we affirm that the Agreement can and should be interpreted and implemented in a manner supportive of WTO members' right to protect public health and, in particular, to promote access to medicines for all. In this connection, we reaffirm the right of WTO members to use, to the full, the provisions in the TRIPS Agreement, which provide flexibility for this purpose"* (point 4).

[63] S. Saha, "Patent law and TRIPS: compulsory licensing of patent and pharmaceuticals", *Journal of the patent and trademark Office Society*, May 2009, p. 364.
[64] WHO, *Public Health, Innovation and Intellectual Property Rights. Report of the Commission on Intellectual Property Rights, Innovation and Public Health*, 2006, p. 22.
[65] WHO, *Public Health, Innovation and Intellectual Property Rights. Report of the Commission on Intellectual Property Rights, Innovation and Public Health*, 2006, p. 55, 82 et seq..

It then states that these *flexible mechanisms* include the right of each Member to issue compulsory licences and their freedom to determine the motives for the issue of said licences, in particular those which constitute a *national emergency* or other *circumstances of extreme urgency*, it being understood that public health crises, including those relating to HIV/AIDS, tuberculosis, malaria and other epidemics, can represent a national emergency or other circumstances of extreme urgency (point 5)[66].

These *flexible* mechanisms entitling Member States to issue compulsory licences has been implemented on numerous occasions, most notably in Africa (Zambia, Zimbabwe) and Asia (Indonesia, Malaysia). Furthermore, the threat of a compulsory licence is a method to put pressure on intellectual property right patent holders to reduce the price of their products or indeed the price of a licence. In this manner, Brazil and South Africa have been able to significantly force down the price of antiretroviral medicines (AIDS)[67].

Finally, following the DOHA Declaration, it has become possible for developing countries to no longer issue compulsory licences to domestic manufacturers but to authorise laboratories established in developed countries to export as part of the WTO compulsory licences scheme[68].

Green technologies: a different intellectual property problem

The differences between innovation structures in the pharmaceutical industry and the field of renewable energies are numerous.

The unique nature of the pharmaceutical industry lies above all in the development costs of a new drug which are, on average, 800 million dollars[69]. Patents play an essential role in encouraging innovation because the monopoly which they grant is the only way to make a return on such an investment. For this reason, the pharmaceutical sector is relatively unchanging and relatively few main players are active in this field, whilst the renewable energy sector is very divided and fragmented with the numerous main players ranging from small and medium-sized businesses to multinationals.

[66] WHO, *Public Health, Innovation and Intellectual Property Rights. Report of the Commission on Intellectual Property Rights, Innovation and Public Health*, 2006, p. 116-123.
[67] C. Henry, *"Développement durable et propriété intellectuelle. Comment l'Europe peut contribuer à la mise en oeuvre des ADPIC"*, *in Droit et économie de la propriété intellectuelle*, edited by M.-A. Frison-Roche and A. Abello, LGDJ, 2005, p. 236. WHO, *Public Health, Innovation and Intellectual Property Rights. Report of the Commission on Intellectual Property Rights, Innovation and Public Health*, 2006, p. 110, 120 and 121 which explains how Brazil used the threat of issuing compulsory licences to force the price of anti-AIDS drugs down.
[68] WHO, *Public Health, Innovation and Intellectual Property Rights. Report of the Commission on Intellectual Property Rights, Innovation and Public Health*, 2006, p. 120. Several countries as well as the European Union have amended their legislation in order to allow such exports (Canada, Norway, Switzerland).
[69] WHO, *Public Health, Innovation and Intellectual Property Rights. Report of the Commission on Intellectual Property Rights, Innovation and Public Health*, 2006, p. 17. The aim of this report is essentially researching ways to encourage innovation with regard to illnesses which are prevalent in developping countries.

Secondly, in the renewable energy sector, the cost of intellectual property is relatively low[70]. The main barrier for developing countries is not the cost of intellectual property but rather the lack of an economic structure which can incorporate and develop these technologies[71].

Finally, in the pharmaceutical industry, technologies and products often cannot be substituted. There are often alternative treatments, but these rarely offer the same effectiveness as the patented product. Conversely, in the field of green technologies, more often than not there are alternative competing technologies, in such a way that the role played by intellectual property is not the same[72].

The question of transferring technology therefore does not arise in the same way for green technologies since it is likely that the impossibility of resorting to previous technologies will not paralyse policies to reduce emissions. However, given the schedule established by the United Nations for reducing emissions, it is essential that the most efficient technologies be transferred to developing countries promptly.

3.3. Compulsory licences resulting from the TRIPS Agreements: a solution to the transfer of technologies?

- The TRIPS Agreements contain provisions authorising Member States to make provisions for certain exceptions to the monopoly conferred by the invention patent title[73].

In this regard, article 31 authorises Member states to make provisions in their legislation for the possibility of issuing compulsory licences with a view to governments or third parties authorised by the state exploiting patent rights[74].

Such a licence can only be granted if the beneficiary has tried in vain to request authorisation from the patent holder to use the patent on *"reasonable commercial terms and conditions, and that such efforts have not been successful within a reasonable period of time"*. A duly qualified authority (administrative or judicial) may then order the patent holder to issue a licence to a designated third party in return for duly specified remuneration.
However, in *national emergencies* or *other circumstances of extreme urgency* or *for public non-commercial purposes*, this first condition does not need to be fulfilled, the only requirement being that the patent holder is informed.

---

[70] WBCSD, Towards a low carbon economy : a business contribution to the international energy and climate debate, 2009.
[71] B. Lee, L. Lliev and F. Preston, *Who owns our low carbon future ? Intellectual property and energy technologies*, Chatham House, September 2009, p. 8.
[72] WTO and UNEP, *Trade and Climate Change*, 2009, p. 48. E. Derclaye, "Not only innovation but collaboration, funding, goodwill and commitment: which role for patent laws in post-Copenhagen climate change action", *John Marshall Review of Intellectual Property Law*, 2010, p. 658.
[73] For a list of cases where licences were refused in the field of green technologies see : C. Hutchinson, "Does TRIPS facilitate or impede climate change technology transfer into developing countries?", *University of Ottawa Law and Technology Journal*, 2006, p. 517, *in particular* p. 532.
[74] However, this article is not binding, inasmuch as the parties can withdraw from it in the context of the bilateral conventions called TRIPS Plus Agreements. P. Arhel, "Propriété intellectuelle. Approche ADPIC-Plus: l'exemple de l'Accord de libre-échange entre les Etats-Unis et le Maroc", *Propriété industrielle*, January 2008, p. 14. P. Arhel, "Le projet d'accord de libre-échange entre l'Union européenne et l'Inde: une nouvelle illustration de l'approche ADPIC-Plus", *Propriété industrielle*, February 2010, p. 15.

In principle, these compulsory licences are stipulated with a requirement to remunerate the patent holder taking into account the *"economic value"* of the authorisation, and the patent holder must receive *"adequate remuneration"*[75].

- Article 31 of the TRIPS Agreements has a general scope of application. It is not limited to the healthcare industry or indeed certain other specified fields such as the arms industry.

This compulsory licence system has been applied on numerous occasions and in a wide range of fields on the basis of national legislations which comply in particular with article 31 of the TRIPS Agreements[76]. In this manner, in August 2006, an American court granted *Toyota* a compulsory licence for three patents belonging to the company *Paice* for a hybrid transmission system in return for $25 for each vehicle sold[77].

- Article 31 provides two distinct abstract cases for granting the compulsory licence.

1/ The first case concerns the case of a patent holder who has refused to grant a licence while the third party was trying to put forward *"reasonable commercial terms and conditions, and that such efforts have not been successful within a reasonable period of time"*.

2/ The second case concerns instances of *"national emergencies* or *other circumstances of extreme urgency or for public non-commercial purposes"*.

The question is knowing if environmental concerns could fall under this second category. No definitive answer can be found since article 31 of the TRIPS Agreements stipulates that compulsory licences are to be implemented on the basis of the particular circumstances of each member state. The difficulty lies in the fact that climate change, unlike healthcare, has diffuse, worldwide effects such that the actions of one state is inevitably insufficient and the emergency is more global than national. Even though no WTO ruling has to our knowledge resolved this issue, it appears that the outlook forecast by IPCC scientists indicates that the necessity of drastically reducing greenhouse gas emissions is likely to constitute a *circumstance of extreme urgency* on the condition that the technology can have significant effects on greenhouse gas emissions in any given place.

The implementation of the compulsory licence: the key issue of the price

- One of the central issues when implementing compulsory licences lies with establishing the price, that is to say the *"adequate remuneration"* of the patent holder (article 31,h). The notion of *"adequate remuneration"* taking into account the *"economic value of the authorisation"* is not defined in the TRIPS Agreements.

[75] Article 31 of the TRIPS Agreements is reproduced in Annex 2.

[76] For a list of licences granted on the basis of this article (and on the basis of national texts) across all continents by developing countries as well as developed countries : Knowledge Ecology International (KEI), J. Packard Love, *Recent examples of the use of compulsory licenses on patents*, KEI Research Note 2007 :2.

[77] The licence was granted during patent infringement action initiated by *Paice* on the basis of its patents. It is therefore a provision of American law which complies with article 44 of the TRIPS Agreements which was applied in this case.

There are several definitions and approaches to the notion of value and a reasonable price. The most common notion used is that of the market price. This concept offers the characteristic of being dependent on unities of place and time. One similar product does not hold the same value in two different places or at different times. The market price or monetary value is defined as *"the assumed value for which it is estimated that one item could find a buyer, if the item were sold at that time (…); the normal price that any buyer would accept to pay (without any exceptional reason of convenience which would make the buyer particularly want the sold good in preference to other similar goods) and corresponding to the normal interplay of supply and demand"*[78].
Thus, the price of a licence depends on the market used by the licensee. It is economically justified for differential prices to be employed.

In the healthcare industry, the royalty fees applied to compulsory licences vary between 0 and 6%. For drugs to combat AIDS, Malaysia fixed this rate at 4%, Mozambique at 2% and Indonesia at 0.5%[79]. Guidelines have been published by the Japanese patent offices (from 2 to 4% of the price of a generic drug) and the Canadian offices (from 0.02 to 4%)[80].

- Other avenues of thought could be contemplated. Any business which supplies its technology or products at a lower price to developing countries or even one which undertakes to not derive profit from its intellectual property rights could receive various forms of "rewards" such as the extension of the duration of the patent in developed countries (for example, a duration of 10 years). Another solution would consist of the government purchasing the technology in return for a price calculated on the basis of the added environmental value of the product[81].

- Finally, the implementation of compulsory licences poses other questions relating in particular to geographical markets, the possibility of importing products from countries where the holder has a patent or even the option of exporting products manufactured and marketed under a compulsory licence.

[78] Vocabulaire Cornu, under "vénal". In law, there is no widely accepted definition of monetary value. H. Hatoux, "Le contrôle de la cour de cassation", *Rapport de la cour de cassation*, 1992, p. 59. For defininitions in jurisprudence: Cass. com., 23 oct. 1984, *Bull. civ.* IV, n° 275, p. 224: "*the monetary value of a good is defined from the price which could be obtained through the interplay of supply and demand in a real market, taking into account the state of the market prior to its transfer*". Trib. civil de Moulins, 30 Jan 1951, unedited: "Where there is no absolute, intrinsic or reasonable value of a good, this value must be determined in reference to the market, in relation to the prices of local and momentary transactions on comparable goods in terms of quality and quantity.".
[79] WHO, *Remuneration guidelines for non-voluntary use of a patent on medical technologies*, Health Economics and Drugs, TCM Series No.18, 2005, p. 39-41.
[80] *Ibid*, p. 68-72. For someone who believes that if the compulsory licence were granted in a country where the patent holder did not intend to invest or make a return, the adequate remuneration should be interpreted as being free, see : S. Saha, "Patent law and TRIPS: compulsory licensing of patent and pharmaceuticals", *Journal of the patent and trademark Office Society*, May 2009, p. 374.
[81] With regard to the healthcare industry, see : WHO, *Public health. Innovation and intellectual property rights. Report of the commission on intellectual property rights, innovation and public health*, 2006, p. 87 et seq. and 123.

Thus, the TRIPS Agreements now offer legal instruments which allow the transfer of technologies to developing countries. But it would be desirable for a declaration from the WTO to stipulate those instances where compulsory licences may be implemented, just as the Doha Declaration played this role in the healthcare industry. And an incentive mechanism for patent holders to exploit of their inventions under preferential conditions would assist in the acceleration of this transfer, in particular through lengthening the duration of protection in developed countries.

Conclusion

The problems of greenhouse gas emissions, and in the future other environmental problems, affect the whole planet. They can only be resolved on a global scale. For this reason, and in the face of the multiple negotiations frameworks on the world stage, it would be desirable for a world environmental organisation to be created which can examine matters of intellectual property.

The first necessity is to encourage green innovation. The option of removing protection on green technologies has been ruled out from the moment that research and development began to be backed predominantly by private businesses. But it does not appear that a modification of the patentability conditions is needed, notably through the relaxation of the condition of inventive activity. On the other hand, the system for the submission of green inventions could be modified, in particular through the acceleration of examination processes, and possibly the reduction of total taxes and annuities.

The second requirement, that of the distribution of green technologies, can sometimes come up against the exclusive nature of patent law if the patent holder uses his invention very little and does not issue licences. It is therefore essential that we encourage patent holders to authorise third parties to make use of their technology. One idea would consist of lengthening the duration of a patent if its owner contributes it to a patent community which issues licences to third parties in return for reasonable royalties. But in view of the fact that incentives are not always sufficient, providing for an instance where a compulsory licence can be issued could be contemplated when an essential green technology is not being distributed as a result of a protectionist strategy by its owner.

The third requirement is the transfer of green technologies to developing countries. Once again, incentives must be the preferred method. It could be decided that if the patent holder of a particular technology accepts its transfer to a third party in a developing country in return for either low royalties or no royalties at all, an increased duration of the intellectual property titles issued in developed countries could be granted.

Finally, a final player has not been sufficiently stressed: the consumer. Ultimately, all things considered, the power to reduce greenhouse gas emissions lies with each consumer. Just as there is a collective responsibility of governments to research solutions on a global scale, there is also a collective responsibility of consumers. But these collective responsibilities are always difficult to accept. Encouraging consumers to reduce emissions must follow two avenues.
On the one hand, there is the awareness of the issues and risks incurred. The role of scientists, journalists and activists is essential. They are the messengers.
On the other hand, there is the consumer information displayed on the products and services purchased. Eco-labels (labels showing the energy efficiency of a product have been adopted in many countries) should be developed extensively in all business sectors, and *green-washing* marketing policies, which consist of misleading consumers about the "green" credentials of a product or service, should be prosecuted across the board in order to guarantee the ecological transparency of every product or service[82].

[82] In the United States, the number of submissions for brands containing the term "*green*" increased from 1,100 in 2006 to 2,400 in 2007 and 3,200 in 2008: E.L. Lane, "Consumer protection in the eco-mark era: a preliminary

References

Books

A. Abello, *La licence, instrument de régulation des droits de propriété intellectuelle*, LGDJ, 2008.

C. Allègre et D de Montvalon, *L'imposture climatique ou la fausse écologie*, Plon, 2010.

L. Ferry, *Le nouvel ordre écologique*, Grasset, 1992.

Hans Jonas, *Le principe responsabilité. Une éthique pour la civilisation technologique*, 1979, traduction française : éd. Du Cerf, 1990.

T. Kirat, *Économie du droit*, La Découverte, 1999.

A. et H.-J. Lucas, *Traité de la propriété littéraire et* artistique, Litec, 3e éd., 2006.

E. Mackaay et S. Rousseau, *Analyse économique du droit*, Dalloz, 2008.

Mathély, *Le nouveau droit français des brevets d'invention*, Librairie du Journal des notaires et des avocats, 1991.

Pouillet, *Traité des brevets d'invention et de la contrefaçon*, 1899.

Survey and assessment of anti-greenwashing activity and eco-mark enforcement", *John Marshall Review of Intellectual Property Law*, 2010, p. 744, which gives accounts of legal cases initiated in the United States by competition authorities and private individuals (in particular *class action*) against misleading marketing campaigns. See also: J. Bowman, "Concept de marque verte. L'art de mieux vendre dans un marché écologique", *Magazine de l'OMPI*, April 2008, p. 8.

Working paper

Chatham House, J. Reichman, A. Rai, G. Newell et J. Wiener, *Intellectual Property and Alternatives : Strategies for Green Innovation,* rapport 08/03, December 2008.

Chatham House, B. Lee, L. Lliev et F. Preston, *Who owns our low carbon future ? Intellectual property and energy technologies*, September 2009.

INPI, Rencontres de l'innovation, February 2010.

Knowledge Ecology International (KEI), J. Packard Love, *Recent examples of the use of compulsory licenses on patents*, KEI Research Note 2007 :2.

WHO (World Health Organisation), *Remuneration guidelines for non-volountary use of a patent on medical technologies*, Health Economics and Drugs, TCM Series No.18, 2005, 106 pages.

WHO (World Health Organisation), *Public Health. Innovation and intellectual property rights. Report on the commission on intellectual property rights, innovation and public health*, 2006, 205 pages.

J. Packard Love, *« Recent examples of the use of compulsory licenses on patents »*, Knowledge Ecology International Research Note 2007:2.

WTO (*World Trade Organisation*) et UNEP (United Nations Environment Programme), *Trade and Climate Changes*, 2009, 185 pages.

WBCSD, *Towards a low carbon economy : a business contribution to the international energy and climate debate*, 2009.

Articles

P. Arhel, « Droit des brevets : vers un meilleur accès à la santé publique », *Propriété industrielle*, July-August 2007, p. 13.

P. Arhel, « Propriété intellectuelle. Approche ADPIC-Plus : l'exemple de l'Accord de libre-échange entre les Etats-Unis et le Maroc », *Propriété industrielle*, January 2008, p. 14.

P. Arhel, « Le projet d'accord de libre-échange entre l'Union européenne et l'Inde : une nouvelle illustration de l'approche ADPIC-Plus », *Propriété industrielle*, February 2010, p. 15.

J.H. Barton, « Brevets et accès aux technologies énergétiques propres dans les pays en développement », *Magazine de l'OMPI*, February 2008, p. 6.

J. Bowman, « Concept de marque verte. L'art de mieux vendre dans un marché écologique », *Magazine de l'OMPI*, April 2008, p .8.

J. Bowman, « Eco-Patent commons pour un partage des brevets éco responsables », Magazine OMPI, June 2009, n°3, p.11.

J. Bowman, « Innovation, environnement et avenir », *Magazine de l'OMPI*, April 2010.

M. Corash, « Cleantech. There is a révolution in the legal and business worlds around climate change », *Law Technology News*, volume 14, Number 12, December 2007.

E. Derclaye, « Not only innovation but collaboration, funding, goodwill and commitment : which role for patent laws in post-copenhagen climate change action », *John Marshall Review of Intellectual Property Law*, 2010, p. 657 (9J. Marshall Rev. Intell. Prop. L.657).

C. Ducruet, « Les technologies vertes concentrent un tiers des demandes », *Les Echos*, March 23 th 2010, p. 10.

G. Ghidini, « Equitable sharing of benefits of biodiversity-based innovation : some reflections Under the shadow of a neen-tree », *Italian Intellectual Property*, July 2002, p. 39-51.

C. Henry, « Développement durable et propriété intellectuelle. Comment l'Europe peut contribuer à la mise en œuvre des ADPIC », *in Droit et économie de la propriété intellectuelle*, sous la direction de M.-A. Frison-Roche et A. Abello, LGDJ, 2005, p. 223-238.

J. A. Herrick, « Federal project financing incentives for green industries : renewable energy and beyond », *Natural Resources Journal*, 2003, p. 77 (43 Nat. Resources J.77).

C. Hutchison, « Does TRIPS facilitate or impede climate change technology transfer into developing countries ? », *University of Ottawa law & Technology Journal*, 2006, p. 517 (3U.Ottawa L.&Tech. J. 517).

J. Jurgensen, « Acteurs privés, pouvoirs publics, organismes internationaux : quels rôles ? », *in L'économie verte*, Cahiers français n° 355 March-April 2010, La Documentation Française.

E. L. Lane, « Consumer protection in the eco-mark era : a preliminary Survey and assessment of anti-greenwashing activity and eco-mark enforcement », *John Marshall Review of Intellectual Property Law*, 2010, p. 742 (9J. Marshall Rev. Intell. Prop. L.742).

R. Lallement, « Le rôle des droits de propriété intellectuelle dans les enjeux post-Kyoto », *Politique climatique : une nouvelle architecture internationale*, La Documentation française, p. 303-319.

W. Landes et R. Posner, *The economic structure of intellectual property law*, Cambridge, MA, Belknap of Havard University Press, 2003.

J. Larrieu, « La propriété intellectuelle et le droit à la santé », *in La propriété intellectuelle, entre autres droits*, sous la direction de J.M. Brugière, Dalloz, 2009, p. 15 s.

E. Laurent, « De Stokholm à Copenhague : les engagements internationaux et leur application », *in L'économie verte*, Cahiers français n° 355, March-April 2010, La Documentation française p. 40.

J. Lerner, « 150 years of patent protection », *American Economic Review Papers and Proceedings*, 2002, p. 221-225.

K. Luzzato, « Patents can help the environment », *IP World*, September 2008, p. 6-9.

E. Mackaay et S. Rousseau, *Analyse économique du droit*, Dalloz, 2008, p. 302-325.

L. Maihes, « Réchauffement climatique : ce que disent vraiment les climato-sceptiques », *Les Echos*, 18 February 2010.

K. Mara, « New Rwanda IP Policy taps information for development », *Intellectual Property Watch*, 8 June 2010.

C. Oguamanam, « Beyond theories : intellectual property dynamics in the global knowledge economy », *Wake Forest Intellectual property Law Journal*, 2009, p. 104 (9 Wake Forest Intell. Prop. L.J. 104).

B. Oppetit, « Droit et économie », *Archives de philosophie du droit, Droit et économie*, t. XXXVII, Sirey, 1992.

C. de Perthuis et S. Shaw, « Normes, écotaxes, marchés de permis : quelle combinaison optimale ? », *in L'économie verte*, Cahiers français n° 355, mars-avril 2010, La Documentation française p. 49-54.

S. Saha, « Patent law and TRIPS : compulsory licensing of patent and pharmaceuticals », *Journal of the patent and trademark Office Society*, May 2009, p. 364 (91 J. Pat. & Trademark Off. Soc'y 364).

J. Schmidt-Szalewski, « La propriété intellectuelle dans la mondialisation », *Propriété industrielle*, June 2006, p. 27

F. Siirainen, « Propriété intellectuelle et concurrence. Problématique de la convergence », *in La propriété intellectuelle, entre autres droits*, sous la direction de J.M. Brugière, Dalloz, 2009, p. 31 s.

A. Strowel, « Utilitarisme et approche économique dans la théorie du droit. Autour de Bentham et de Posner », *Archives de philosophie du droit, Droit et économie,* t. XXXVII, Sirey, 1992, p. 143- 171.

A. Tabarrok, « Patent theory versus patent law, *Contribution to economic analysis and Policy*, 2002, 1-24.

J. de Werra, « Brevets d'invention et protection de l'environnement : conflit ou harmonie ? », *Liber Amicorum Anne Petitpierre-Sauvain, Economie Environnement Ethique. De la responsabilité sociale et sociétale*, Sculthess, 2010, p. 409-421.

Annex 1 : Declaration of DOHA November 14th November 2001

Ministerial Declaration of Doha dated November 14th 2001 (extract)

17. We stress the importance we attach to implementation and interpretation of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) in a manner supportive of public health, by promoting both access to existing medicines and research and development into new medicines and, in this connection, are adopting a separate declaration.

Declaration on the TRIPS agreement and public health adopted on November 14th 2001

1. We recognize the gravity of the public health problems afflicting many developing and least-developed countries, especially those resulting from HIV/AIDS, tuberculosis, malaria and other epidemics.
2. We stress the need for the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) to be part of the wider national and international action to address these problems.
3. We recognize that intellectual property protection is important for the development of new medicines. We also recognize the concerns about its effects on prices.
4. We agree that the TRIPS Agreement does not and should not prevent members from taking measures to protect public health. Accordingly, while reiterating our commitment to the TRIPS Agreement, we affirm that the Agreement can and should be interpreted and implemented in a manner supportive of WTO members' right to protect public health and, in particular, to promote access to medicines for all. In this connection, we reaffirm the right of WTO members to use, to the full, the provisions in the TRIPS Agreement, which provide flexibility for this purpose.
5. Accordingly and in the light of paragraph 4 above, while maintaining our commitments in the TRIPS Agreement, we recognize that these flexibilities include :

a. In applying the customary rules of interpretation of public international law, each provision of the TRIPS Agreement shall be read in the light of the object and purpose of the Agreement as expressed, in particular, in its objectives and principles.
b. Each member has the right to grant compulsory licenses and the freedom to determine the grounds upon which such licenses are granted.
c. Each member has the right to determine what constitutes a national emergency or other circumstances of extreme urgency, it being understood that public health crises, including those relating to HIV/AIDS, tuberculosis, malaria and other epidemics, can represent a national emergency or other circumstances of extreme urgency.
d. The effect of the provisions in the TRIPS Agreement that are relevant to the exhaustion of intellectual property rights is to leave each member free to establish its own regime for such exhaustion without challenge, subject to the MFN and national treatment provisions of Articles 3 and 4.

6. We recognize that WTO members with insufficient or no manufacturing capacities in the pharmaceutical sector could face difficulties in making effective use of compulsory licensing under the TRIPS Agreement. We instruct the Council for TRIPS to find an expeditious solution to this problem and to report to the General Council before the end of 2002.

7. We reaffirm the commitment of developed-country members to provide incentives to their enterprises and institutions to promote and encourage technology transfer to least-developed country members pursuant to Article 66.2. We also agree that the least-developed country members will not be obliged, with respect to pharmaceutical products, to implement or apply Sections 5 and 7 of Part II of the TRIPS Agreement or to enforce rights provided for under these Sections until 1 January 2016, without prejudice to the right of least-developed country members to seek other extensions of the transition periods as provided for in Article 66.1 of the TRIPS Agreement. We instruct the Council for TRIPS to take the necessary action to give effect to this pursuant to Article 66.1 of the TRIPS Agreement.

Annex 2 : Articles 31 et 44 of TRIPS

Article 31 : Other Use Without Authorization of the Right Holder

Where the law of a Member allows for other use of the subject matter of a patent without the authorization of the right holder, including use by the government or third parties authorized by the government, the following provisions shall be respected:

(a) authorization of such use shall be considered on its individual merits;

(b) 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 circumstances of extreme urgency or in cases of public non-commercial use. In situations of national emergency or other circumstances of extreme urgency, the right holder shall, nevertheless, be notified as soon as reasonably practicable. In the case of public non-commercial use, where the government or contractor, without making a patent search, knows or has demonstrable grounds to know that a valid patent is or will be used by or for the government, the right holder shall be informed promptly;

(c) the scope and duration of such use shall be limited to the purpose for which it was authorized, and in the case of semi-conductor technology shall only be for public non-commercial use or to remedy a practice determined after judicial or administrative process to be anti-competitive;

(d) such use shall be non-exclusive;

(e) such use shall be non-assignable, except with that part of the enterprise or goodwill which enjoys such use;

(f) any such use shall be authorized predominantly for the supply of the domestic market of the Member authorizing such use;

(g) authorization for such use shall be liable, subject to adequate protection of the legitimate interests of the persons so authorized, to be terminated if and when the circumstances which led to it cease to exist and are unlikely to recur. The competent authority shall have the authority to review, upon motivated request, the continued existence of these circumstances;

(h) the right holder shall be paid adequate remuneration in the circumstances of each case, taking into account the economic value of the authorization;

(i) the legal validity of any decision relating to the authorization of such use shall be subject to judicial review or other independent review by a distinct higher authority in that Member;

(j) any decision relating to the remuneration provided in respect of such use shall be subject to judicial review or other independent review by a distinct higher authority in that Member;
(k) Members are not obliged to apply the conditions set forth in subparagraphs (b) and (f) where such use is permitted to remedy a practice determined after judicial or administrative process to be anti-competitive. The need to correct anti-competitive practices may be taken into account in determining the amount of remuneration in such cases. Competent authorities shall have the authority to refuse termination of authorization if and when the conditions which led to such authorization are likely to recur;
(l) where such use is authorized to permit the exploitation of a patent ("the second patent") which cannot be exploited without infringing another patent ("the first patent"), the following additional conditions shall apply : (i) the invention claimed in the second patent shall involve an important technical advance of considerable economic significance in relation to the invention claimed in the first patent ; (ii) the owner of the first patent shall be entitled to a cross-license on reasonable terms to use the invention claimed in the second patent; and (iii) the use authorized in respect of the first patent shall be non-assignable except with the assignment of the second patent.

Article 44 : Injunctions

1. The judicial authorities shall have the authority to order a party to desist from an infringement, *inter alia* to prevent the entry into the channels of commerce in their jurisdiction of imported goods that involve the infringement of an intellectual property right, immediately after customs clearance of such goods. Members are not obliged to accord such authority in respect of protected subject matter acquired or ordered by a person prior to knowing or having reasonable grounds to know that dealing in such subject matter would entail the infringement of an intellectual property right.
2. Notwithstanding the other provisions of this Part and provided that the provisions of Part II specifically addressing use by governments, or by third parties authorized by a government, without the authorization of the right holder are complied with, Members may limit the remedies available against such use to payment of remuneration in accordance with subparagraph (h) of Article 31. In other cases, the remedies under this Part shall apply or, where these remedies are inconsistent with a Member's law, declaratory judgments and adequate compensation shall be available.

Annex 3 : Extract of French IP Code (CPI)

Article L.613-11 of du CPI

On expiry of a period of three years from the grant of a patent or four years from the filing date of the application and subject to the conditions laid down in the following Articles, any public or private legal person may be granted a compulsory license under the patent provided that, at the time of the application for such license and failing legitimate reasons, neither the owner of the patent nor his successor in title :

a)Has begun to work or has made real and effective preparations for working the invention that is the subject matter of the patent on the territory of a Member State of the European Community or another State party to the Agreement on the European Economic Area;

b)Has marketed the product that is the subject matter of the patent in a quantity sufficient to satisfy the needs of the French market.

The same shall apply where working, as mentioned under (a) above, or marketing, as mentioned under (b) above, in France has been discontinued for more than three years.

For the purposes of the application of this Article, the importation of patented goods manufactured in a State party to the Agreement Establishing the World Trade Organization shall be considered working of the patent.

Article L.613-12 of CPI

The application for a compulsory license shall be made to the First Instance Court; it must be accompanied by evidence establishing that the applicant has been unable to obtain a license from the owner of the patent and that he is in a position to work the invention in an effective and serious manner.

A compulsory license shall be granted on fixed terms, particularly in respect of its duration, its field of application and the amount of the royalties to be paid in consideration thereof. Those terms may be amended by court decision on a request by the owner or the licensee.

Article L. 613-15 of CPI

The holder of a patent infringing a prior patent may not exploit his patent without the consent of the holder of the prior patent; the latter may not exploit the subsequent patent without the consent of the holder of the subsequent patent.

Where a holder of a patent cannot exploit it without infringing a prior patent of which a third party is a holder, the *Tribunal de grande instance* (High Court) may grant him a license of the prior patent to the extent necessary for exploiting the patent of which he is a holder and inasmuch as that invention constitutes with regard to the prior patent a substantial technical progress and is of considerable economic interest.

The license granted to the holder of the subsequent patent may be transferred only together with the said patent.

On application brought before the Court, the holder of the prior patent shall be granted a cross-license of the subsequent patent.

The provisions of Articles L613-12 to L613-14 shall apply.

Article L. 613-16 of CPI

If the interests of public health demand it and in absence of an out-of-court settlement with the holder of the patent, the Minister responsible for industrial property, at the request of the Minister responsible for health, may subject by way of an order to the ex officio licensing scheme under the conditions provided for in Article L613-17,.
a) a medical product, a medical device, a medical device for in vitro diagnosis, an additional therapeutic product ;
b) their process for the breeding, a product necessary for their breeding or a process for manufacturing such product ;
c) an ex vivo diagnostic method.
The patents of these products, processes or diagnostic methods may be subjected to ex officio licensing scheme in the interest of the public health only where these products, products resulting from these processes or these methods are made available to the public in insufficient quantity or quality or at abnormally high prices, or where the patent is exploited under conditions contrary to the interest of the public health or is judged as an anti-competitive practice by a final administrative or court decision.
Where the purpose of the license is to remedy an anti-competitive practice or in urgent cases, the Minister responsible for patent rights shall not be held to seek an out-of-court settlement.

Article L.613-17 of CPI

As from the date of publication of the order subjecting the patent to ex officio licenses, any qualified person may apply to the Minister responsible for industrial property for the grant of a license to work the patent. The license shall be granted by order of that Minister under fixed conditions, particularly in respect of its duration and field of application, but excluding the amount of the royalties to be paid in consideration thereof.
The license shall take effect from the date of notification of the order to the parties.
In the absence of amicable agreement approved by the Minister responsible for industrial property and the Minister responsible for health, the amount of the royalties shall be laid down by the First Instance Court.

Article L.613-18 of CPI

The Minister responsible for industrial property may give formal notice to the owners of patents other than those referred to in Article L613-16 to undertake the working of such patents so as to satisfy the requirements of the national economy.
If no action is taken within a period of one year to comply with such notice and if the failure to work the invention or the insufficiency in quality or quantity of the working seriously prejudice economic development and the public interest, the patents in respect of which formal notice has been given may be subjected to ex officio licenses by *Conseil d'Etat* decree.
The Minister responsible for industrial property may extend the one-year period referred to above if the owner of the patent can produce legitimate reasons consistent with the demands of the national economy.
As from the date of publication of the decree subjecting the patent to ex officio licenses, any qualified person may apply to the Minister responsible for industrial property for the grant of a license to work the patent.
The license may only be non-exclusive: it shall be granted by an order of the above-mentioned Minister on fixed conditions with regard to its duration and field of application, but excluding the amount of royalties to be paid in consideration thereof. The license shall take effect from the date of notification of the order to the parties.
Failing amicable agreement, the amount of the royalties shall be laid down by the First Instance Court.

CONTENTS