Intellectual Property

This section is devoted to giving readers an inside view of the crossing point between intellectual property (IP) law and risk regulation. In addition to updating readers on the latest developments in IP law and policies in technological fields (including chemicals, pharmaceuticals, biotechnology, agriculture and foodstuffs), the section aims at verifying whether such laws and policies really stimulate scientific and technical progress and are capable of minimising the risks posed by on-going industrial developments to individuals' health and safety, inter alia.

Climate Change and Intellectual Property

I. Introduction – The Copenhagen Accord

On 19 December 2009, at the end of the United Nations (UN) Climate Change Conference (COP15) in the Danish capital, the Copenhagen Accord was announced. Signed by a group of countries including the United States, China, India and South Africa, this agreement has been described by commentators and the public at large as 'empty' and 'weak'. By falling far short of any real commitment to the reduction of greenhouses gas emissions – particularly of carbon dioxide – the accord has accomplished little beyond outlining voluntary pledges by UN member States. The result is that nations will simply set emissions targets of their own, but if they fall short of these, no substantial action will be taken in consequence.

The outcome of the Accord has therefore been hailed as disappointing. It should have sent clear signals to the global markets that important changes in the fight against climate change (and against global warming in particular[1]) would be imminent and unavoidable. It did not.

Most strikingly, this agreement has not imposed any binding obligation on industrialised countries to transfer to developing nations what are commonly known as Environmentally Sound Technologies (ESTs)[2]. Such technologies – which are usually developed and commercially exploited by companies located in industrialised countries – have the potential for engendering significantly improved environmental performance by being less polluting and using resources in a more sustainable manner. Examples of these technologies are found in the solar photovoltaic and biofuel fields, as well as in the wind-energy sector.

The dissemination and use of ESTs, especially in developing countries, would almost certainly help governments, companies and other organisations in the fight against climate change, and also provide them with an opportunity to leapfrog the process of resource-intensive and highly polluting growth experienced by industrialised countries[3]. The advantage of using ESTs therefore would be twofold.

Moreover, in the Accord no specific reference is made to intellectual property rights (IPRs) as a necessary tool for stimulating the transfer and general dissemination of ESTs and climate technologies, especially to developing countries. In fact, the possible introduction of such a reference had been the subject of intense talks during the pre-Accord negotiations. Some developing countries – such as Bolivia and India – were in favour of clarifying the role of IPRs in stimulating the diffusion of ESTs, whereas a few industrialised countries (such as the United States and the European Union) held that IPRs should not be part of the agreement in question or any other climate accord. Industrialised states probably fear that the act of integrating or even mentioning IPRs in this kind of accord would jeopardise the protection of their intellectual property rights. Yet the reasons behind such a resistance are not entirely clear. In the context of previous negotiations on other environmental agreements, industrialised countries have finally agreed to incorporate references to IPRs into technology transfer provisions. For example, Article 16.2 of the UN

1 Global warming is the increase in the average temperature of the Earth's near-surface air and oceans since the mid-20th century and its projected continuation. Global surface temperature increased between the start and the end of the 20th century. The Intergovernmental Panel on Climate Change (which is the leading body for the assessment of climate change) has concluded that most of the observed temperature increase since the middle of the 20th century was caused by increasing concentrations of greenhouse gases resulting from human activity, such as fossil fuel burning and deforestation.

2 Technology transfer is mentioned in certain parts of the Copenhagen Accord, such provisions consisting of mere "soft law" however. For example Article 11 states that "*in order to enhance action on development and transfer of technology we decide to establish a Technology Mechanism to accelerate technology development and transfer in support of action on adaptation and mitigation that will be guided by a country-driven approach and be based on national circumstances and priorities.*" Article 3 provides that "*we agree that developed countries shall provide adequate, predictable and sustainable financial resources, technology and capacity-building to support the implementation of adaptation action in developing countries.*" See also Article 5 and 8.

3 Lee, Bernice/Iliev, Ilian/Preston, Felix, *Who Owns Our Low Carbon Future? Intellectual Property and Energy Technologies*, 2009, available on the Internet at www.chathamhouse.org.uk/files/14699_r0909_lowcarbonfuture.pdf , p. 59 (last accessed on 20 January 2010).

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Convention on Biological Diversity (in providing that access to and transfer of genetic resources-related technology to developing countries shall be provided and facilitated under fair and most favourable terms) clarifies that "in the case of technology subject to patents and other intellectual property rights, such access and transfer shall be provided on terms which recognizes and are consistent with the adequate and effective protection of intellectual property rights."[4]

II. IPRs and environmentally-friendly technologies

Why are IPRs so important when it comes to environmentally-friendly technologies, especially climate technologies?

It should be noted that the development of these technologies demands significant and costly research and development (R&D). Such investments in R&D can, like most investment, be stimulated and then recouped by offering investors exclusive rights on the technologies developed: this is usually achieved by either granting patents covering the ESTs or protecting such technologies as confidential information[5]. National and regional legislations, and also international treaties, such as the TRIPs Agreement[6], provide protection of such IPRs. For example, Article 27 of this Agreement includes ESTs and climate technologies[7] because it clarifies that patent protection must be available in any field of technology.

It is well known that many ESTs were patented in the past and they are still being protected by patents. In the decade following 1996, for example, there was a nine-fold increase in wind-related patents and a five-fold increase in solar photovoltaic patents.

These patent-related innovation hubs are located across a variety of sectors. The top reported locations of patents assignees or owners are primarily in OECD countries, with the United States leading the table, followed by Germany, Japan, Denmark and South Korea. Particularly in the wind sector, the United States and Japan are the leading locations for filing patents, together with the European Patent Office. The United States and Japan are also leading locations for patent filing in solar photovoltaic energy, followed by the World Intellectual Property Organization (WIPO) (via the Patent Cooperation Treaty system[8]) and emerging markets, such as China, where the rates of filing patents in this field are also increasing. The leading location for patents related to biomass-to-electricity[9] is Japan (such data reflects the primary role played by Japanese companies in this field), followed by the United States. In the concentrated solar power and cleaner coal fields[10], the leading patent filing locations are also the United States, Japan and China. Finally, in the carbon capture and storage field[11] more patents have been filed in the Unites States than in all other countries taken together, which confirms the US leadership in this sector[12].

We have seen that IPRs are a key tool for stimulating the production of climate change technologies and then recouping the relevant investment. This assertion is shared by many in industrialised and R&D-intensive countries with strong patents-based innovation systems. Indeed, in such states IPRs– by

4 The Convention on Biological Diversity has three main goals: (i) conservation of biological diversity, (ii) sustainable use of its components and (iii) fair and equitable sharing of benefits arising from genetic resources (including genetic resources technology). In other words, its objective is to develop national strategies for the conservation and sustainable use of biological diversity. This treaty is often seen as the key document regarding sustainable development. I dealt with the technology transfer issues of the Biodiversity Convention in my last book, see Bonadio, Enrico, *Sistema Brevettuale 'TRIPS' e risorse genetiche – Esigenze commerciali e interessi pubblici* (Napoli: Jovene 2008), at p. 239.

5 Barton, John, *IP and Climate Technology*, 2007, available on the Internet at www.chathamhouse.org.uk/files/13696_161107_ipclimate.pdf (last accessed on 20 January 2010), at p. 4.

6 TRIPs Agreement was signed by all World Trade Organization (WTO) countries and covers all types of intellectual property including patents, plant varieties, industrial designs, copyright and trademarks. It requires IPRs to be protected in all WTO member countries. For a thorough analysis of the TRIPs Agreement see Gervais, Daniel, *The TRIPS Agreement: Drafting History and Analysis*, 3rd ed. (London: Sweet & Maxwell 2008).

7 Protection of confidential information is provided by Article 39 of the TRIPs Agreement.

8 The Patent Cooperation Treaty – also known as PCT – is an international patent law treaty administered by WIPO. It provides a unified procedure for filing patent applications to protect inventions in each of its contracting States. A patent application filed under the PCT is called an international application, or PCT application.

9 Biomass, a renewable energy source, is biological material derived from living or recently living organisms, such as wood, waste, and alcohol fuels. Biomass is usually plant matter grown to generate electricity or produce heat. For example, forest residues (such as dead trees, branches and tree stumps), yard clippings and wood chips may be used as biomass. Biomass may also include plant or animal matter used for production of fibres or chemicals as well as biodegradable wastes that can be burnt as fuel.

10 Concentrated solar power is meant to provide cheaper and more scalable electricity generations in regions with good levels of sunlight. Coal power makes a significant contribution to power generation in most developed and developing countries.

11 Carbon capture and storage is a means of mitigating the contribution of fossil fuel emissions to global warming, based on capturing carbon dioxide from large point sources such as fossil fuel power plants, and store it away from atmosphere by different means.

12 All the above data are mentioned in Lee/Iliev/Preston, *Who Owns Our Low Carbon Future?*, *supra* note 3, pp. 12 et sqq.

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providing protection against free-riding and imitation – are seen as the basis of societal innovation and also as drivers of the dissemination of important technologies, including ESTs. In particular, it is believed that a global protection of IPRs creates a certain and reliable normative context in which private companies are encouraged to transfer their proprietary information and technologies across different countries[13].

On the other hand, there are several governments, companies and non-governmental organizations – especially in the developing world – which doubt the role played by IPRs in stimulating the transfer of technologies, particularly of ESTs and climate technologies. In particular, they claim that a strong protection of intellectual property rights often allows them to adopt anti-competitive and abusive behaviours[14], because such protection provides rights holders with monopolistic rights on the technology covered by the said IPRs. This means that they slow down rather than stimulate the international circulation of technologies, including climate technologies[15]. Therefore, stimulation of technology transfer should be sought in other areas such as the degree of competitiveness in the market in question, the level of bureaucratisation in the public sector, the grant of fiscal incentives by governments and the existence of governmental controls on contractual strategies and schemes[16].

The above thesis appears to be confirmed by statistical data, such as the data on foreign direct investments (FDIs) carried out by United States in the 1980s (FDIs are relevant here as they often entail transfers of technologies): in those years most US FDIs went to countries which did not provide adequate IPR protection[17], and this would confirm that protecting intellectual property rights is not the main force that drives technology transfer.

III. Problems posed by IPR legislation and practice

It is generally accepted that granting IPRs is a key element for stimulating the development of ESTs and of climate technologies in particular. However, it appears from the above that the same is not true as far as transfer of these technologies to developing countries is concerned.

Several commentators and scholars also maintain that in certain cases IPRs are capable of obstructing the dissemination of ESTs across countries. This seems to be confirmed (i) by how IPR legislation is drawn up in industrialised countries and (ii) by a sharp increase in international patent litigation in this field.

With reference to point (i) let us take the US scenario as an example. In this country, climate technologies are mainly developed and held by a few private firms: indeed such a concentration of ESTs – which has not, by the way, triggered any substantial transfers of such technologies outside the United States – was prompted in the last three decades by the Bayh-Dole Act, passed by Congress in 1980. How did we get to this scenario? First of all, this law, which is the key legislation on IP aspects of government grants to universities, allows private recipients of public-funded research to apply and own patents resulting from the abovementioned research: an opportunity that private companies have obviously exploited. Secondly, the Bayh-Dole Act has pursued domestic industrial property targets by requiring holders of patents issued on the basis of government funding (including the federal government) to license technologies for the purpose of manufactur-

13 Branstetter, Lee, "Do stronger patents induce more local innovation?", in Maskus, Keith and Reichman, Jerome (eds), *International Public Goods and Transfer of Technology Under a Globalized Intellectual Property Regime* (Cambridge: UK Cambridge University Press 2005), pp. 309 et sqq., at p. 319. The importance of protecting IPRs for enhancing technology transfer has often been stressed by the US government, see the Minutes of meeting of the TRIPs Council, WTO Doc. IP/C/M/29, at p. 70.

14 For example, imposing high prices for patented technologies prevents many companies and entities, both private and public (especially in developing countries), from purchasing the same: which clearly hinders the dissemination of such technologies. See Walker, Simon, *The TRIPS Agreement and the Public Interest* (Washington: Island Press 2001), at p. 18.

15 Correa, Carlos, "Can the TRIPS Agreement foster technology transfer to developing countries?", in Maskus and Reichman (eds), *International Public Goods and Transfer of Technology*, supra note 13, pp. 227 et sqq., at p. 232.

16 The fact that technology transfers are driven also by factors other than IPR protection has been stressed by Maskus, Keith, *Encouraging International Technology Transfer, UNCTAD – ICTSD Project on IPRs and Sustainable Development*, 2004, available on the Internet at www.iprsonline.org/unctadictsd/docs/CS_Maskus.pdf (last accessed on 20 January 2010), at pp. 3, 19, 26 and 29. As far as the relationship between IPRs protection and technology transfer is concerned see also Dutfield, Graham, *Intellectual Property, Biogenetic Resources and Traditional Knowledge*, (London: Earthscan 2004), pp. 82 et sqq.

17 Correa, "Can the TRIPS Agreement foster technology transfer to developing countries", *supra* note 15, at p. 228. It has also been noted that in certain developing countries (such as Nigeria, Chile and Mexico) the opposite scenario – i.e. the introduction of systems of IPRs protection (particularly in the pharmaceutical field) – had a negative impact on the flow of investments towards said States. See Dutfield, *Intellectual Property, Biogenetic Resources*, *supra* note 16, at p. 199.

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ing inside the United States[18]. In particular, Section 204 of the Bayh-Dole Act requires that the licensee of technology developed under the grant commits itself that the relevant products "be manufactured substantially" in the United States.

Other governments might follow the path taken by the US and try to provide domestic subsidies for innovative technologies in order to boost national industrial development. In particular, other industrialised States – in the pursue of mercantilist trade policies – might be tempted to favour policies designed to strengthen national industries and accordingly might not prompt their enterprises to transfer technologies to developing countries.

Any such restrictions on the foreign production of technologies will clearly have a negative impact on the dissemination and use of ESTs, particularly of climate technologies[19].

In relation to point (ii) above, there has been a marked rise in high-profile international patent litigation involving the technologies in question, especially in the wind and solar photovoltaic fields; such lawsuits are driven by aggressive corporate IP strategies and enforcement plans. This increase in litigation involving ESTs is worrying, as these lawsuits are usually expensive and time-consuming and can therefore result in delays in the diffusion and use of key climate energy technologies, especially in developing countries [20].

IV. Possible solutions and recommendations

What are the possible solutions to the problems highlighted above?

In the run-up to the Copenhagen conference, the negotiating text produced by the United Nations Framework Convention on Climate Change (released in May 2009) made reference to different options including, inter alia, patent compulsory licensing schemes (i.e. a mechanism for non-voluntary authorisation to use patents) and exemptions from patent protection in the field of climate technologies.

Exemption from patent protection seems to be too radical and to go 'too far'. Such a proposal frightened off industrialised countries like the United States which invest heavily in R&D and therefore oppose any attempt to broadly curtail IPRs. In this regard the US House of Representatives strongly recommended that IPRs should be definitely protected in the Copenhagen negotiations; several media interventions by the US Chamber of Commerce's Global Intellectual Property Center similarly called for the safeguarding of patent laws in the climate change talks.

Compulsory licensing schemes, on the other hand, are less controversial and could be the right answer to facilitating the transfer of ESTs, especially climate technologies. After all, such schemes have already been experienced in certain countries, including the United States. For example, the US Clean Air Act provides the compulsory licensing of patented technologies needed to meet agreed standards and – by virtue of this act – in 2006 a US court granted the Toyota company a compulsory licence on three Paice patents for hybrid transmissions, for a royalty of $ 25 per automobile[21]. These schemes comply with international provisions, including Article 31 of the TRIPs Agreement which allows WTO member countries to issue compulsory licences, provided certain conditions are met.

The above compulsory licensing schemes should be welcomed, especially if these licences are intended for dissemination of the technologies in question in developing countries. However, this is not enough.

As a general observation, the developed nations should change their attitude towards the international transfer of climate technologies. Western governments should avoid favouring domestic industries when licensing publicly funded inventions (especially ESTs) which are of global environmental importance. As has been pointed out[22], it is possible to insist on making these technologies available to developing countries on a low-royalty humanitarian basis, or to use "march-in" rights more freely than is current usage. In particular, the public sector in de-

18 Abbott, Frederick, *Innovation and Technology Transfer to Address Climate Change: Lessons from the Global Debate on Intellectual Property and Public Health*, 2009, available on the Internet at www.iprsonline.org/New%202009/innovation-and-technology-transfer-to-address-climate-change.pdf (last accessed on 20 January 2010), at p. 21. See also Barton, John, *Intellectual Property and Access to Clean Energy Technology in Developing Countries. An analysis of Solar Photovoltaic, Biofuel and Wind Technologies*, 2007, available on the Internet at www.iprsonline.org/New%20 2009/CC%20Barton.pdf (last accessed on 20 January 2010).

19 Abbott, *Innovation and Technology Transfer to Address Climate Change*, *supra* note 18, pp. 21 et sqq.

20 Some examples of litigation in this field are provided by Lee/Iliev/Preston, *Who Owns Our Low Carbon Future?*, *supra* note 3, pp. 54 et sqq.

21 Lee/Iliev/Preston, *Who Owns Our Low Carbon Future?*, *supra* note 3, pp. 3 et sqq.

22 Barton, *Intellectual Property and Access to Clean Energy Technology in Developing Countries*, *supra* note 18, at p. 35.

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veloped nations should support the design and creation of patent pools and cross-licensing schemes to encourage the dissemination of climate technologies in developing countries. These patent pools could be used to support small and medium enterprises in the emerging markets in exchange for a low royalty fee[23]. This much hoped for approach would be similar to the "humanitarian licensing" scheme proposed earlier in the medical and agricultural fields[24].

Encouraging signals have been given recently. In one case the mercantilist condition stated in Section 204 of the Bayh-Dole Act was waived by the US government, i.e. the waiver by the US National Institutes of Health Office of Technology Transfer with reference to licencing tropical disease technologies to developing countries[25].

International organizations such as the World Intellectual Property Organization (WIPO) should also use their influence. As has been proposed[26], it would be advisable to set up global databases on licensing and cross-licensing patent pools on climate technologies. Such databases could support the establishment of benchmarks and determination of best practice in patent licensing negotiations between private companies or in public-private partnerships. WIPO in particular, and other organizations dealing with IPRs, should request patent owners to register their licensing deals within a certain time period to protect their latest commercial interests on a voluntary basis. The result of all this could be that these best practices in innovation and diffusion of climate technology might be shared in a way that both encourages innovation and complies with patentees' rights. This could also be a way for enterprises and other entities to present their latest inventions available for licensing.

It has also been argued that a Declaration on IPRs and Climate Change would be needed, as this would reinforce the trend toward finding a balance between innovation and the transfer of climate technologies at international level[27]. This declaration would be similar and comparable to the Doha Declaration on the TRIPs Agreement and Public Health, adopted by the WTO Conference in 2001, and should affirm the availability of flexible arrangements offered by the TRIPs Agreement for pursuing the dissemination and use of patented ESTs and climate technologies (such as compulsory and government-use patent licensing, limited exceptions to patent rights, variability in patentability standards, and potential for liability regimes).

Finally, what is the most suitable solution for addressing the issue of time-consuming and costly litigation in connection with patented climate technologies? One proposal could be the provision of heavy penalties against the plaintiff in cases where it can be established that a frivolous lawsuit has been brought with the sole purpose of frightening a competitor wishing to distribute similar technologies. This would discourage any such frivolous lawsuits and promote the availability of ESTs and climate technologies on the international markets.

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Regulatory Impact Assessment

This section regularly examines Regulatory Impact Assessment (IA) at three levels: the EU, the Member States and internationally. Contributions aim to cover aspects such as the interface between IA and risk analysis, looking at methodologies as well as legal and political science-related issues. Contributions are meant to report and critically assess recent developments in the field, develop strategic thinking, and make constructive recommendations for improving performance in IA processes.

Keeping the Centre of Gravity Work: Impact Assessment, Scientific Advice and Regulatory Reform

I. Introduction

Impact Assessment (IA) is a tool that assists regulators in their efforts to structure decision-making and increase the effectiveness of regulatory outcomes. As such, it reduces the risk of regulatory failure. If

23 Lee/Iliev/Preston, *Who Owns Our Low Carbon Future?*, *supra* note 3, at p. 60.

24 Brewster, Amanda/Chapman, Audrey and Hansen, Stephen, "Facilitating Humanitarian Access to Pharmaceutical and Agricultural Innovation", *Innovation Strategy Today* (2005), pp. 203 et sqq., at p. 205.

25 Barton, *Intellectual Property and Access to Clean Energy Technology in Developing Countries*, *supra* note 18, at p. 8.

26 Lee/Iliev/Preston, *Who Owns Our Low Carbon Future?*, *supra* note 3, at p. 59.

27 Abbott, *Innovation and Technology Transfer to Address Climate Change*, *supra* note 18, at p. 26.

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