

Nordisk Miljörättslig Tidskrift



Nordic Environmental Law Journal

2010:2

www.nordiskmiljoratt.se

Nordisk Miljörättslig Tidskrift/Nordic Environmental Law Journal 2010:2

ISSN: 2000-4273

Redaktör och ansvarig utgivare/Editor and publisher: Gabriel Michanek

Webpage <http://www.nordiskmiljoratt.se/omtidskriften.asp> (which also includes writing instructions).

Special issue

Climate Change and Intellectual Property Rights:

Legal Frameworks and Institutions for the Development and
Transfer of Environmental Sound Technologies

Guest editors

Tine Sommer, Sanford E. Gaines & Birgitte Egelund Olsen

Content

Tine Sommer, Sanford E. Gaines & Birgitte Egelund Olsen: **Guest editorial note**
...page 105

Han Somsen & Morag Goodwin: **Regulating for Climate Change in Developing Countries: Appropriate Regulatory Strategies in the Context of Technology Transfer** ...page 111

Ilona Cheyne: **Intellectual Property and Climate Change from a Trade Perspective** ... page 121

Marianne Levin: **Intellectual Property Rights (IPR) – Another Untested Hurdle in Copenhagen** ... page 131

Mohammad Monirul Azam: **Climate Change and Intellectual property after COP 15: In Search of a Workable Framework for the Transfer of ESTs** ... page 145

Tine Sommer: **Designing Substantive Patent Law: From Life Sciences to Climate Change?** ... page 161

Dr. Catherine Rhodes: **Opportunities and Constraints for Cooperation between International Organisations** ... page 175

Ellen Margrethe Basse & Sanford E. Gaines: **'Common but Differentiated Responsibilities and Respective Capabilities'** as Part of the post-2012 Climate regime ... page 189

Fernando do Rego Barros Filho: **Global concerns and renewable energy policies: The Use of Regional Vegetal Resources to Create Growth Zones in Developing Countries** ... page 205

Conference Speakers ... page 213

The current issue of Nordic Environmental Law Journal is a special issue on *Climate Change and Intellectual Property Rights: Legal Frameworks and Institutions for the Development and Transfer of Environmentally Sound Technologies*. The journal issue is based on presentations made at an international conference on the topic organized by the guest editors and held in Sandbjerg, Denmark, from May 11 to 12, 2010. The conference was funded by The Danish Council for Independent Research | Social Sciences, JURFORSK and Aarhus School of Business, Aarhus University.

The conference brought together researchers and analysts within the fields of environmental law, trade law and intellectual property law to join forces in mapping climate change challenges and technological solutions in an interdisciplinary context. With a focus on both the problems and their solutions, the aim was to improve disciplinary interplay and to advance legal and institutional knowledge, drawing lessons from different areas of law for the appropriate role of technological innovation and technology diffusion in addressing climate change.

The first day of the conference emphasised *the legal toolbox of today* for addressing climate change. The guiding questions were the following:

- What are the barriers to innovation and transfer of environmentally sound technologies (ESTs) in current environmental law, trade law and IPR law?
- What role do IPRs play in the development of alternative energy technologies?
- What incentives other than IPRs can promote innovation in ESTs?
- How do trade regimes and the transfer and the dissemination of ESTs interact?
- How can we frame an emissions trading system with incentives to innovate?
- Who will ensure investment in ESTs for developing countries?

The second day aimed toward global solutions and social responsibility, addressed as *the legal toolbox of tomorrow*. Questions discussed in that regard were:

- How can we engage policymakers at intergovernmental legal institutions and supranational actors such as the World Trade Organization, the Climate Change regime, EU, the European Patent Organisation, United States Patent and Trademark Office..
- What new approaches or policy mixes can address global concerns and overcome differences in outlook or goals between developed and developing countries?
- Should changes to the WTO agreement on Trade-Related Aspects of Intellectual Property Rights be considered – and if so what changes?
- What new strategies or institutions are needed to support the 2007 Bali Action plan, which emphasises technological innovation and transfer as a key element in the context of climate change.
- Should new tools take the form of a binding commitment? Or should the choice of tools remain flexible?

The current special issue covers different topics from the toolboxes of both today and tomorrow representing many of the conference speakers'

contributions. Did the participants of the conference come any closer to a solution by putting the legal instruments in a toolbox of today and one of tomorrow?

Climate change is a major global environmental challenge. Mitigating global warming and adapting to its consequences will require major economic investment and, above all, clear and unambiguous determination on the part of policy-makers. With a challenge of this magnitude, multilateral cooperation is crucial, and a successful conclusion of global negotiations on climate change would be a crucial step towards achieving sustainable development for future generations. Technology development and transfer has been identified as a key element in the Bali Action Plan, which thus brings about the need to address trade and intellectual property rights (IPRs) in the context of climate change. During the conference it was argued that existing WTO rules provide members with some scope to take action on climate change. However, they do constrain domestic regulatory policy, and the debate about future institutional changes will be central to how effectively global environmental issues such as climate change will be addressed.

It is often thought that the very idea of exclusive rights brings the IPR lawyers and trade lawyers into collision with environmental lawyers - that exclusive rights may hinder the diffusion, if not the development, of green technologies. Thus, the IPR institutions will push the development in the wrong direction. However, bringing IPR, trade and environmental scholars together to discuss this cross-disciplinary theme did prove the benefit of ongoing discussion. As it turned out, researchers in the fields of IPR, trade law and environmental law do belong to the same species.

In spite of the conference's focus on IPRs, the conclusion must be drawn that IPRs are only one of many tools for combating climate change in so far as they can further investments in environmentally sound technologies. However, dissemination of such technologies may be hindered by the very same exclusive rights. Dealing with the latter problem will be precisely where the legal world's attention will be directed when we are discussing IPR as an instrument, among other instruments, to meet the challenges of climate change. By joining forces, the legal toolbox for combating climate change will contain schemes of emission trading, taxes, standards, investments, capacity building, corporate social responsibility, exclusive rights (protection of emerging clean technologies) and technology transfer.

Nevertheless, the conference papers point to the need for more empirical analysis of the prevalence of IPR in energy technologies and other climate-relevant sectors, and the extent to which specific climate projects in developing countries have been or are likely to be affected by IPR considerations. One step

in that direction, appearing after our conference and after the articles were written, is the study jointly conducted by The European Patent Office (EPO), the United Nations Environment Programme (UNEP) and the International Centre for Trade and Sustainable Development (ICTSD): *Patents and clean energy: bridging the gap between evidence and policy*, released September 30, 2010. The study found that over 80 percent of all clean energy innovations originate from just six countries – Japan, the United States, Germany, Korea, France and the United Kingdom – and the licensing survey found limited licensing activity to developing countries (Brazil, China and India). In a press release Achim Steiner, UN Under-Secretary General and Executive Director of the UN Environment Programme (UNEP) said:

“Far from being a drag on economies and innovation, international efforts to combat climate change have sparked technological creativity on low carbon, resource efficient Green Economy solutions. The challenge now is to find ways in which these advances can be diffused, spread and transferred everywhere so that the benefits to both economies and the climate are shared by the many rather than the few’ (UUwww.epo.org).”

The following will provide the reader with a brief introduction to the articles in the journal. We will leave it to our readers to decide whether the IPR/environmental/trade law discussion on climate change has been taken any further.

In *Regulating for Climate Change in Developing Countries: Appropriate Regulatory Strategies in the Context of Technology Transfer*, Han Somsen and Morag Goodwin focus on the step beyond intellectual property law to look at conditions and relevant regulatory strategies to facilitate take-up of new technologies in developing countries themselves. Working from what is known about the design of effective regulation in Europe and the little that is known about effective regulation in developing countries in the context of environmental law, they sketch out how regulatory design applies in the broader end of creating a legal toolbox in the context of climate change. They warn against the tendency to transfer sophisticated incentive-based regulatory “technology” from Western countries and urge closer attention to the political and administrative realities of developing countries, where simpler regulatory approaches may be more effective.

The second article has an international trade perspective. In *Intellectual Property and Climate Change from a Trade Perspective*, Ilona Cheyne discusses the implications of the TRIPS agreement. As IPRs are often accused of being an obstacle to tech transfer, Cheyne considers whether TRIPS might constrain or assist WTO members in transferring climate change technologies. Reviewing the TRIPS provisions, her pragmatic conclusion essentially states that from the

current international trade perspective TRIPS is providing members of the WTO with significant discretionary power and that the agreement may be positively beneficial by promoting confidence through balance and predictability.

In the third article, Marianne Levin focuses on intellectual property rights in 'green' treaties – taking the readers from Rio to Copenhagen. The article *Intellectual Property Rights (IPR) – Another Untested Hurdle in Copenhagen* addresses the growing awareness of IPR at all levels as challenging the system. Levin argues that this awareness also advanced several important statements during the last years, such as for example a public health amendment to TRIPS, the WIPO Development Agenda and the WHO global strategy on public health, innovation and intellectual property. The relationship between environmental degradation and climate change is at risk of becoming the next big IP confrontation after pharmaceuticals.

Innovation, green technologies and transfer of technology are all important factors in combating global climate change. In his article *Climate Change and Intellectual property after COP 15: In Search of a Workable Framework for the Transfer of ESTs*, Mohammad Monirul Azam directs attention to the lack of investment capacity for R&D on ESTs in developing countries and the imbalance between owners and users of protected environmentally sound technologies. From the context of international environmental law and intellectual property law, the article offers proposals to guide climate negotiation and transfer of ESTs.

In the fifth article, *Designing Substantive Patent Law: From Life Sciences to Climate Change?*, Tine Sommer emphasises that there are lessons to be learned by future lawmakers and policymakers working in the field of climate change. Changing substantive patent law in order to green the face of patent law may turn out to be a bad solution. When discussing patent law it is necessary to determine whether changes are required in the pre-grant phase or in the post-grant phase. So far, previous experiences with the pre-grant phase do not point to substantive changes.

Addressing the question of how to engage policymakers and supranational actors working across multiple intergovernmental legal institutions, Catherine Rhodes, in the sixth article, *Opportunities and Constraints for Cooperation between International Organizations*, argues that most challenges cut across the remit of several international organizations, thus requiring coordination. Rhodes examines cooperation between international organizations in two areas, genetic resources and biofuels, to highlight key policy issues in this increasingly important form of governance..

In their article, *Common but Differentiated Responsibilities and Respective Capabilities as Part of the Post-2012 Climate Regime*, Ellen Margrethe Basse & Sanford E. Gaines look at technology transfer through the lens of the CBDR principle that guides action on climate change based on different responsibilities for developed and developing countries. The Kyoto Clean Development Mechanism (CDM) is consistent with CBDR but has not been effective enough to date. International negotiators have developed some mechanisms and are discussing others that may enhance incentives for technology transfer, including monitoring of “nationally appropriate mitigation actions” for developing countries and possible sector-based carbon market systems to reduce emissions below “business as usual” practices.

Finally, the last contribution is a case study of the efficiency of the Brazilian National Program of Biodiesel. In the article, *Global Concerns and Renewable Energy Policies: The Use of Regional Vegetal Resources to Create Growth Zones in Developing Countries*, Fernando do Rego Barros Filho states that the replacement of the current world energy model based on fossil fuels with non-carbon energy is a global issue and that law as a social life organizer has an instrumental function. Thus, a legal framework for biofuels must respect ecologic balance, economic viability, social inclusion and culture preservation. The article analysis is devoted to the possibility and viability of local renewable resources to develop its host regions.

Special thanks to our Linda Andersen of our staff for her outstanding effort in helping with the conference, and to our student assistants, Marina Møller Bitsch and Malene Munk Sørensen, for their assistance with the conference and especially in preparing the papers for publication.

Aarhus, October 2010

Tine Sommer, Sanford E. Gaines & Birgitte Egelund Olsen

Regulating for Climate Change in Developing Countries: Appropriate Regulatory Strategies in the Context of Technology Transfer

Morag Goodwin & Han Somsen#*

This paper takes the discussion about legal tools in the context of climate change beyond the focus on intellectual property law to direct attention instead to the importance of regulatory frameworks within developing countries themselves. Our contention is that access to technologies represents only half the picture, with the other half concerning absorption of those technologies at the domestic level. In particular, we take what is known about the design of effective regulation in Europe and the little that is known about effective regulation in developing countries in the context of environmental law, and sketch out how this might apply to the broader end of creating a legal toolbox in the context of climate change.

1. Introduction

This short paper takes the discussion about legal tools for technology transfer in the context of climate change beyond the focus of intellectual property law, directing attention instead to the importance of regulatory frameworks within developing countries themselves. Access to technologies is only half the picture.¹ The take-up of technology is the other half of the picture, and the ability of a country to do so successfully will depend on a number of factors. Where a developing country has access to technology (green or otherwise), there are any number of barriers that may prevent its effective utilisation within a developing country, even where there is willingness to do so. It is for this reason that we have chosen to focus on the receiving country and to look beyond intellectual property law to the design of regulation within developing countries. In particular, we take what is known about the design of effective regulation in Europe and the little that is known about effective

regulation in developing countries in the context of environmental law, to sketch out how this might apply to the broader end of creating a legal toolbox in the context of climate change. Part of our response to the questions posed by this conference concerning the creation of the best legal environment for the design of technologies to combat climate change is that such ‘technologies’ must include regulatory techniques and simple environment law.

2. Taking a developing country perspective

Those working on development-related issues understand that efforts to tackle climate change will need to take due account of the specific context and needs of developing countries.² Even more specifically, a focus on the ability to take up technologies and regulatory techniques in the context of tackling climate change will require attention to the particular regulatory system within individual developing countries. Success in assisting developing countries in adapting to climate change will therefore require those concerned to take account of political, geo-political, environmental and administrative differences in each and every country.³ Yet, while there is an inherent danger in referring to ‘developing countries’ of failing to take account of these specificities, there is sufficient commonality nonetheless in the types of problems they face to make a generalised approach worthwhile, at least in suggesting indicators to be applied in the context of the specific situation. There are two main elements

that need to be considered in taking a developing country perspective. The first concerns the importance of taking the development needs of developing countries into consideration when designing regulation that either protects the environment or aims at creating the context for the absorption of transferred technology (whether green or not). Taking such broader development needs into account is vitally important for the success of global adaptation or mitigation efforts, not least because climate change imposes an additional burden to development but also given that the majority of those worst affected by climate change will be located in those countries least able to cope with the extra demands.⁴ What this requires will vary in practice, but we would suggest that it includes a mind-set that understands efforts at adaptation to climate change as part of a country's wider development agenda. One part of doing this in regard to the design of regulation will be to take account of the notion of the 'developmental state' i.e. the idea that developing states may require a particular legal and administrative configuration in order to kick-start economic growth – a configuration centred on a strong state. This idea does not sit well with the predominant neo-liberal approach to the interaction between the state and markets.⁵ Another aspect, particularly in relation to technology transfer, concerns the nature of the technology itself, which must be suitable to the developing country context. There is considerable empirical evidence to suggest, for example, that high-labour and low-capital technologies are best suited to development needs, by providing more employment and greater value-added to communities.⁶ The design of technology for mitigation or adaptation in the context of climate change will therefore need to be designed with developing countries in mind; as the green technologies likely to suit the needs of the developed world – low-labour, high-capital

– are likely to undermine development efforts elsewhere. Despite the importance of a development-facilitating approach, however, we do not have space to give further consideration to this requirement here.⁷

The second main element in a developing-country perspective concerns the particular administrative and legal context of developing countries in relation to designing regulatory tools and techniques to assist in combating the effects of climate change. In recent years, the law and economics literature has provided a detailed analysis of the conditions and consequences of the limited governance capacities prevalent in many developing countries. This literature has identified low administrative capacity and corruption as two of the biggest problems facing developing countries in their efforts to implement laws designed to facilitate economic growth, problems that will certainly affect these countries' ability to respond effectively to climate change. Recent additions to this debate have suggested that, although the low effectiveness of regulation is frequently a consequence of a desperate economic situation as much as it is a cause thereof, the quality of the regulatory framework is an important stand-alone factor in determining regulatory effectiveness that is independent of standard measures of development, such as national income.⁸ What this means is that the design of environmental regulation has an equally large impact on the effectiveness of environmental regulation and hence upon developing countries' ability to respond effectively to the threats posed by climate change. The example of environmental law suggests that for regulation in developing countries to be effective, it needs to take into account limited administrative capacities, the degree and prevalence of corruption and other relevant factors, such as the reach of informal law or the distribution of power between the centre and

localities, in its design. Regulation is thus more likely to be effective where it is designed specifically to function under such (non-ideal) conditions.

3. Lessons from Europe

The lessons of European attempts at environmental regulation provide some helpful clues about regulatory design. Our perhaps counter-intuitive suggestion is that, despite the limited resources of state regulators, command-and-control legislation better connects with the regulatory environments that characterize developing countries than contemporary alternatives emphasizing 'governance' and 'responsiveness'.⁹ In this section we further elaborate on this premise by examining important experience gained at the domestic level since the European Union first embarked upon an environmental policy in the early 1970s.

Although perhaps hard to imagine in 2010, countries like Spain and Portugal did not have anything even remotely resembling ministries for the environment when they first acceded to the Union; the same applies to some of the central and eastern European countries that joined more recently. EU experience gained with past accessions of Member States with under-developed administrative traditions provides valuable lessons for developing countries. In this section, we focus in particular on two inter-related challenges that together in good part determined the effectiveness of environmental regulation, or lack of it, in the European Union in general, and in the accession countries in particular.

The first challenge concerns the choice of environmental standard. The second concerns the implementation and enforcement of the chosen environmental standards, which inevitably

requires the involvement of public authorities to a greater or lesser extent.

A. Environmental standards: basic rules of thumb

There is a more to be said about environmental standards than is feasible in the context of this short article, but in essence the crucial choice facing regulators is between adopting relatively crude standards that are administratively simple to fix and to enforce, and sophisticated standards that require much higher levels of scientific and administrative expertise.¹⁰

This choice pertains to the level of environmental protection those standards ought to reflect, as well as the form those standards ought to take. As for the form of regulations, in the pursuit of combating climate change regulators may adopt product standards, process standards, emission standards, or ambient quality standards. We argue that for developing countries, process and ambient quality standards more often than not will be *prima facie* unsuitable.¹¹

Standards are crude when they relate to the environmental performance of products (product standards) or industrial installations (emission standards) without having regard to the receiving environments (water, air, soil) they are intended to protect. By way of example, emissions by diesel-engines have been regulated (product standards) without regard to the impact of the sum-total of the growing number of diesel-engines on climate change.¹² Similarly, for discharges of toxic, bio-accumulative and persistent heavy metals into the aquatic environment, maximum concentrations (emission values) have been fixed without specifying a ceiling for the rivers, lakes and seas in which those substances are discharged.¹³ In such cases, regulation may be either under-inclusive or over-inclusive, but in any event is almost certain to be

sub-optimal relative to the environmental goals it is intended to serve.

Within the EU, there has been a conscious policy to replace the crude standards of the 1970s and 80s relating to discharges in water and air with much more sophisticated alternatives tailored to ecological quality objectives. Again by way of illustration, instead of substantively regulating the quality of discharges, the Union has moved towards procedurally regulating the ecological quality of river basins in a 'river basin management plan'.¹⁴

Whereas such more sophisticated approaches may address the problem of sub-optimal regulation, this comes at a hefty price. Even for a highly developed polity such as the EU, it is proving a tall scientific and administrative order to quantitatively express ecological quality, let alone translate that generic standard into a level for individual discharges. Obviously, monitoring compliance with simple emission values that concern the quality of individual discharges of point sources is also considerably easier than having to police, for instance, entire river basins or areas of air space. Indeed, one of the most attractive features of crude standards is that they are enforceable.

In summary, if there is a single lesson that should be learned from EU experience it is that, when it comes to standards, it is imperative to know how to walk before attempting to run. Crude standards that are about right are therefore more effective in ensuring environmental protection, albeit imperfectly, than sophisticated standards that may turn out to be precisely wrong or impossible to monitor and enforce. We turn to the issue of enforcement next

B. Public and private enforcement

Where deficits in public know-how, capacity or commitment to implement and enforce environmental standards go unaddressed, the standards adopted will not effect improvements in the environmental performance of firms.¹⁵ Early common law examples of environmental law apart, the enforcement of environmental law is traditionally entrusted to some kind of public authority. This is in good part because the scope of personal rights and remedies is too restricted to serve the enforcement of contemporary environmental laws regulating the oceans, the atmosphere, habitats and other common goods.

Effective enforcement (which in this context we understand as securing compliance with legally prescribed standards) first of all implies that breaches of the law are detected. As we observed above, depending on the nature of the standards that are at stake, this will require different degrees of administrative sophistication on the part of the enforcement agency.

Presuming that regulators have wisely opted for crude standards, breaches of which are more easily detected, enforcement agencies are still likely to lack the resources needed to systematically detect those breaches. Within the EU, initiatives to offset this problem by mobilizing the vigilance of private individuals have been really successful only in respect of legislation protecting birds and habitats.¹⁶ This success is due mainly to the fact that destructions of habitats are of course easy to detect, but also because well-funded and well-staffed NGOs have not shied away from starting costly litigation to enforce the law.

Although similar successes have not been registered in respect of other important elements of the environment, initiatives that require the establishment of publicly accessible registers

detailing the environmental performance of firms are nonetheless important. This is because, apart from the detection of breaches, effective enforcement of environmental standards also implies that public authorities take action to persuade or compel firms to comply.

Literature on the enforcement of environmental law shows that it is important that the law allows enforcement agencies to discriminate between the cynical calculating perpetrator of an environmental wrong, which calls for coercive action, and the incompetent law-breaker, who needs education and persuasion.¹⁷ Obviously, this implies considerable discretionary powers on the part of enforcement agencies, in turn inviting abuse and capture. Publicly accessible registers are important because they allow for the public, or civil society, to exercise a supervisory role.

Finally, persuasive approaches can only be expected to result in higher long-term compliance levels if recourse to dissuasive and deterring coercive measures is available and realistic.¹⁸ Within the EU, this last insight has resulted in the adoption of legislation compelling Member States to resort to criminal law for the enforcement of environmental crime.¹⁹ Given that this legislation was adopted specifically in response to the accession of central and eastern European states that did not have the administrative traditions to deal effectively with major breaches of environmental law, there is every reason to assume that criminal environmental law could be equally important for the developing world.

4. Designing effective regulation in developing countries

Given the limited space here, it is only possible to state the indicators suggested by earlier research by one of the current authors, in collaboration with others, for the design of effective regulation in developing countries.²⁰

The first indicator concerns the definition of effectiveness. While effectiveness will clearly be determined by whether the regulatory regime succeeds in assisting a country in the achievement of its goals in accessing and absorbing the necessary technology to combat climate change, those goals must be set by the countries themselves. The effectiveness of regulatory reform therefore turns on whether it fixes problems and achieves goals set by governing authorities of developing countries, *including* development goals. This suggests that developing countries may seek a different balance between environmental protection and economic growth. In sum, effectiveness should not be determined by the parameters of economic theory or Northern-derived standards of good governance.

The importance of developing countries setting their own goals determines the second indicator as well. Any form of regulation is political, and regulation aimed at balancing the protection of the environment with overall development goals is particularly so as it is likely to entail redistribution between groups in society. For such regulation to be perceived as legitimate by those whom it purports to govern, there needs to be open recognition of the political nature of regulation aimed at adapting to climate change and an opening up of the process of decision-making to contestation by those likely to be negatively affected (although this last point must be read in conjunction with the fourth indicator, below).

The third indicator builds upon research in the field of law and economics specifically focusing on developing countries. This research suggests that where governance capacity is weak, it is better to avoid legal instruments that require high levels of administrative capability to be effectively implemented. Contrary to theory

based upon Northern models, for developing countries setting out precise rules in legislation is more likely to be effective than flexible instruments containing vague standards. Fixed rules have lower implementation and compliance costs than variable standards, thus making them more suitable in systems with low capacity; in leaving little scope for discretion, fixed rules are also less vulnerable to corruption at the implementation stage.²¹

The fourth indicator suggests that a centralised command-and-control type regulatory framework is more likely to be effective where capacity is weak. This finding flagrantly contradicts the trend in governance thinking in developed countries towards decentralised decision-making processes. While there are obvious apparent benefits to locating decision-making closer to the people it affects, the risk of capture by local elites and corruption among officials are generally higher at the local level than at the centre.²² Similarly, whilst open public participation in decision-making is also widely viewed as a good thing for obvious legitimacy-based reasons, where corruption is primarily opportunistic, public participation may actually provide greater scope for corruption by providing the opportunity for contact between officials and those who are to be regulated.²³ However, where corruption is endemic, transparency in decision-making and the active participation of civil society actors in the processes of regulation are more likely to work to reduce corruption.

However, the fifth indicator provides that the most suitable location of decision-making is not so straightforward as the fourth indicator suggests. Decision-making tends to be most efficiently located at the central level because it is more cost effective and thus better suited to situations in which administrative capacity is

weak and resources are low; and because centralised government structures are more likely to have the tools and resources to ensure implementation, and less likely to face capture by lobby groups or local elites. However, that said, determination of the most suitable location of regulatory decision-making will be affected by the relative levels of corruption at the local and central levels. Where, for example, corruption is endemic within the central government, it may well be more effective to de-centralise decision-making processes, regardless of whether it is less cost-effective.

These indicators are obviously broad prescriptions for how to go about designing regulation in developing countries; the most effective combination of indicators will depend upon the conditions at work in a particular country. But what do they tell us about regulation in the context of climate change?

5. Lessons for regulation in the context of climate change

The first broad point to note is that the research upon which the suggestions here are based indicates that theories and modes of regulation that are developed in the global North are unlikely to be effective when transplanted to developing countries, where administrative and systemic conditions as well as priorities are likely to be very different. This has important implications for the regulatory instruments most associated with combating climate change, such as environmental taxes and tradable emission rights.²⁴ These 'smart' environmental instruments are flexible and vague, and thus rely heavily on administrative capacity and a strong public interest ethos within the administration for effective implementation. They also rely upon strong scientific knowledge to set the standards at the right level and to monitor compliance. They are thus unsuitable in design for countries

that struggle with limited resources, weak administrative capacity and corruption. A global system of tradable emission rights that does not take the conditions of developing countries into account is unlikely to function successfully, for example. Similarly, environmental taxes that require civil servants to set and collect the income are unsuited to a corruption-rich environment. The indicators presented here suggest that a rule-based instrument containing firm prescriptions set and enforced at the central level is more likely to be effective in the developing country context. Moreover, lessons from Europe suggest that these rule-based instruments should be backed up by clear and dissuasive criminal sanctions. Yet these findings dramatically contradict the types of instruments currently promoted for climate change mitigation and adaptation.

In the context of technology transfer, our research further suggests that the design of regulation to facilitate international technology transfer within developing countries needs to be country specific and take account of different levels of development by following the indicators outlined above. This will affect not only the priorities of a given country but also the resources available for regulatory implementation and enforcement. Climate-change related international technology transfer thus needs to be situated within the broader development agenda as both the environmental and political effects of climate change will play out differently in each country. For example, the need to address the effects of climate change will affect the setting of priorities differently in a small island nation, vulnerable to rising sea levels and dependent upon tourism, compared to a member of the BRIC grouping.²⁵ Within this context, consideration should ideally be given in least developed countries to the preference for technology that is high labour/ low capital, not only for the direct contribution such technology is likely to make towards

development goals but also for the indirect contribution of spill-over effects from the transferred technology, which are more likely to occur where the technology concerned is appropriate to the general level of economic development.²⁶

More particularly, a command-and-control type of approach is more likely to be suitable to a regulatory framework aimed at fostering international technology transfer; and the choice as to where to locate decision-making processes should be informed by questions of cost effectiveness and administrative capacity as well as the relative risks of corruption and/ or capture, rather than by Northern ideas of efficiency or of good governance norms.

In sum, what we know about effective regulation in the area of environmental law can, and more importantly *should*, inform efforts at developing regimes for the international transfer of technology in the context of combating the effects of climate change in developing countries. Where efforts are focused solely at the level of removing barriers to International Technology Transfer at the international level or where the technology itself is designed for developed country circumstances, greener technology will fail to be absorbed at the national and local level in developing countries. Likewise, where we rely upon regulatory instruments designed to suit the regulatory conditions of the global North as a template for the creation of a legal toolbox to tackle climate change, the results are likely to be disastrous – not simply in terms of effectiveness but in real terms as measured by the lives devastated by unmitigated climate change effects. While there remains much that we do not understand about creating the conditions for absorptive capacity, we do know how to design regulation likely to be more effective. What we have attempted to do within the limited space

here is give notice that the dominant regulatory approach at the global level to tackling climate change seems to be the wrong one; to be properly inclusive and relatively effective, it needs to be designed to take account of the regulatory weakness of developing countries and not the regulatory strengths of the developed world.

* Lecturer, Tilburg Institute for Law, Technology and Society (TILT); m.e.a.goodwin@uvt.nl.

Professor, Tilburg Institute for Law, Technology and Society (TILT); han.somsen@uvt.nl.

¹ A detailed study on the workings of technology transfer in the context of the Montreal Protocol on CFCs suggests that intellectual property law in fact did not constitute a significant barrier for developing countries; see Stephen O. Anderson, K. Madhava Sarma and Kristen N. Taddonio, *Technology Transfer for the Ozone Layer. Lessons for Climate Change* (London: Earthscan, 2007). How pertinent such observations are in the context of climate change, given the likelihood that new green technology will be more sophisticated and more expensive to develop, is difficult to assess; yet even where access to such technology does constitute a barrier to technology transfer, it still only constitutes part of the equation.

² World Bank, *Development and Climate Change*, World Development Report 2010, Washington D.C.

³ See *Technology Transfer for the Ozone Layer* (2007), op cit. and *Development and Climate Change*, ibid.

⁴ World Bank (n. 2) chapter 1.

⁵ See, e.g., Tom Ginsburg, 'Does Law Matter for Economic Development? Evidence for East Asia', 34 *Law and Society Review* 829 (2000). Also Joseph Stiglitz, *Making Globalization Work* (Penguin, 2006).

⁶ See Jeffrey James, *Technology, Globalization and Poverty* (Cheltenham: Edward Elgar: 2002), 71-111, examining what he terms pro-poor modes of technical integration into the global economy.

⁷ A good starting point in this literature is Ginsburg (n. 2).

⁸ See for an excellent summary of this literature in relation to environmental law, Dan C. Esty & Michael E. Porter, 'National Environmental Performance: an Empirical Analysis of Policy Results and the Determinance', 10 *Environment and Development Economics* 391-434 (2005).

⁹ We use the term 'responsive regulation' in a very broad fashion to embrace notions of deliberative democracy, and the intelligent employment of actors and tools to enhance or substitute public regulatory capacities. See in

similar vein, J. Braithwaite, 'Responsive Regulation and Developing Economies' (2006) 34 *World Development*, 884.

¹⁰ H. Somsen, 'Current Issues of Implementation, Compliance and Enforcement of EC Environmental Law: A Critical Analysis' in L. Krämer (ed.), *Liber Amicorum Gert Winter* (Groningen: Europa Publishing, 2003), 415-28.

¹¹ For arguments that *a fortiori* apply to developing nations, see H. Somsen, 'Current Issues of Implementation, Compliance and Enforcement of EC Environmental Law: A Critical Analysis' in L. Krämer (ed.), *Liber Amicorum Gert Winter* (Groningen: Europa Publishing, 2003), 415-28.

¹² Council Directive 88/77/EEC relating to the measures to be taken against the emission of gaseous pollutants from diesel engines for use in vehicles (OJ 1988 L 36).

¹³ Directive 76/464/EC on Dangerous Substances Discharged into the Aquatic Environment (OJ 1974 L 129).

¹⁴ Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for Community action in the field of water policy (OJ 2000 L 327).

¹⁵ See for example H. Somsen, discretion of Member States in European environmental law: H. Somsen, 'Discretion in European Community Environmental Law' *Common Market Law Review* 40 (2003) 6, p. 1413-53. See also H. Somsen, 'The Private Enforcement of Member State Compliance with EC Environmental Law: an Unfulfilled Promise?', (2000) 1 *Yearbook of European Environmental Law*, 311-60.

¹⁶ H. Somsen, 'The Private Enforcement of Member State Compliance with EC Environmental Law: an Unfulfilled Promise?', (2000) 1 *Yearbook of European Environmental Law*, 311-60.

¹⁷ K. Hawkins, *Environment and Enforcement* (Oxford: Clarendon Press, 1984).

¹⁸ I. Ayres and J. Braithwaite, *Responsive Regulation: Transcending the Regulatory Debate* (Oxford: Oxford University Press, 1992).

¹⁹ Directive 2008/99/EC on the protection of the environment through criminal law, OJ 1998 L 328/28.

²⁰ The findings in this section are taken from Michael Faure, Morag Goodwin & Franziska Weber, 'Bucking the Kuznets Curve: Designing Effective Regulation in Developing Countries' (2010) 15 *Virginia Journal of International Law* (forthcoming). This article details the process of development of the indicators.

²¹ See Anthony Ogus, 'Corruption and Regulatory Structures', (2004) 26 *Law and Policy* 229-246; Anthony Ogus, 'Regulatory Arrangements in Developing Countries', in: Eger, T., Bigus, J., Ott, C. & Von Wangenheim, G., *Internationalisierung des Rechts und seine*

ökonomische Analyse/ Internationalization of the law and its Economic Analysis, Festschrift für Hans-Bernd Schäfer zum 65. Geburtstag (Wiesbaden: Gabler, 2008), 721-734.

²² R.L. Revesz, 'Federalism and Environmental Regulation: an overview' in *Environmental Law, The Economy and Sustainable Development* 37-79 (Richard L. Revesz, Philippe Sands & Richard B. Stewart eds., Cambridge University Press, 2000); and R.L. Revesz, 'Federalism and Environmental Regulation: Lessons for the European Union and the International Community', (1997) 83 *Virginia Law Review* 1331.

²³ A. Ogus, 'Regulatory Arrangements in Developing Countries' in *Internationalisierung des Rechts und seine Ökonomische Analyse* 721-734 (Eger, Bigus, Ott, & Von Wangenheim (eds.), Festschrift für Hans-Bernd Schäfer zum 65. Geburtstag, Wiesbaden: Gabler, 2008).

²⁴ See Global Environment Outlook (GEO) 4, 2007, by United Nations Environment Programme (UNEP), available at http://www.unep.org/geo/geo4/report/GEO-4_Report_Full_en.pdf, pp. 30 (particularly the charts). Among the variety of economic instruments suggested are property rights, market creation, fiscal instruments, charge systems, financial instruments, liability systems, bonds and deposits. Similarly, see the UNEP Guidelines on Compliance and Enforcement of Multilateral Environmental Agreements <http://www.unep.org/dec/onlinemanual/Home/tabid/36/Default.aspx> and <http://www.unep.org/dec/onlinemanual/Enforcement/InstitutionalFrameworks/EconomicInstruments/tabid/88/Default.aspx> (especially guideline 41(g)). See also *World Bank Development Report 2010: Development and Climate Change*, Washington, 2009 for the suggestion of smart instruments in developing countries, despite an awareness of the capacity and resource challenges such countries face.

²⁵ BRIC stands for Brazil, Russia, India and China, although some also speak of a BRIIC group that includes Indonesia. 'Everybody's friend. Indonesia deserves a better image', *The Economist*, 10 September 2009.

²⁶ E. Kesidou & A. Szirmai, 'Local Knowledge Spillovers. Innovation and Economic Performance in Developing Countries: A Discussion of Alternative Specifications', UNU-MERIT Working Paper 2008-033.

Intellectual Property and Climate Change from a Trade Perspective

*Ilona Cheyne**

Intellectual property rights are often accused of being a barrier to the dissemination of climate change technologies. The Trade-Related Intellectual Property Agreement (TRIPS) is particularly criticised because it obliges WTO Members to protect intellectual property rights and is enforceable through a powerful dispute settlement system. The purpose of this article is to consider whether TRIPS might constrain or assist WTO members in transferring climate change technologies. A review of the provisions of TRIPS suggests that WTO members retain significant discretionary powers which may assist climate change technology transfer. Indeed, TRIPS may be positively beneficial by promoting confidence through balance and predictability.

1. Introduction

Intellectual property rights (IPRs) have often been accused of placing unnecessary obstacles in the way of transfer of climate change technologies (CCTs). They are criticised for imposing higher costs, hindering further innovation by patent thickets or wilful obstruction, and discouraging trade and investment.¹ The WTO Trade-Related Intellectual Property Agreement (TRIPS) is often implicated in these accusations because it requires WTO Members to protect intellectual property rights and is supported by a powerful dispute settlement process.² Questions about the precise relationship between TRIPS and national intellectual property law, and between intellectual property and technology transfer, need greater investigation.³ However, the urgent need to respond to climate change suggests that significant time and effort should not be given to what may turn out be misplaced criticism. The question that this paper seeks to answer is whether TRIPS significantly constrains the power

of WTO Members to regulate patents in order to promote the transfer of CCTs.

This enquiry is set against the complex scientific, political and economic problem of climate change, a problem which is multifocal, resistant to simple answers and inseparable from contemporary industrial practices. Although developed countries have contributed to the beginning of raised greenhouse gas emissions, rapidly developing economies, such as China, are rapidly joining the group of major emitters.⁴ Transferring CCTs to developing countries is therefore an inherent part of climate strategy and is featured in the key climate change instruments, including the UN Framework Convention on Climate Change, the Kyoto Protocol, the Bali Action Plan, and the Copenhagen Accord.⁵ However, there is little mention of intellectual property despite its obvious connection to technological innovation and diffusion, perhaps because the relationship between intellectual property rights and the development and use of climate change technology remains uncertain. In addition, there is the practical difficulty of defining a CCT from the intellectual property perspective. For example, potentially useful technology might be something specifically designed for the purpose, or something that is incidentally useful; it might be central or peripheral to a climate change measure; it might relate to mitigation or adaptation; it might be aimed at a sink or a source. This makes it difficult to see how intellectual property rules might be adapted to differentiate between CCTs and other forms of invention.⁶

However, from a trade regulatory perspective, the role that TRIPS might play in facilitating or obstructing technology transfer of environmentally friendly inventions cannot be ignored.⁷ The purpose of this paper is to consider the constraints that TRIPS might place on the ability of Members to regulate patentability and the exercise of intellectual property rights over CCTs. For the sake of brevity, the analysis will focus on patents.⁸ Certain assumptions are made: that successful climate change mitigation and adaptation requires technological innovation, that patents create an incentive to innovate, that such incentives cannot be adequately provided by other means such as prizes,⁹ and that eliminating patent protection will defeat the objective of finding effective technological solutions to the problem of climate change.¹⁰ It is accepted that the existence and exploitation of patents may lead to obstacles to technology transfer in some circumstances. Likewise, it is not argued here that market mechanisms are sufficient in themselves; public regulation and non-private funding will be required. Parallel strategies will be needed, such as voluntary non-exclusive licensing and technology pools, and patent rights that do cause obstruction may have to be bought out at a premium.¹¹

The argument proposed is that TRIPS does not necessarily impede technology transfer for climate change policies. A review of its provisions suggests that the minimum standards for patentability laid down by TRIPS are limited and underdefined, and that some areas of patent law are left untouched, leaving significant areas of Member discretion. In addition, TRIPS contains exclusions from patentability and exceptions to the exercise of patent rights. Combined with a well-balanced jurisprudential approach from panels and the Appellate Body, TRIPS and its enforceability through the powerful WTO dispute settlement process is less

constraining on technology transfer than is sometimes claimed.¹² In so far as TRIPS provides a compromise that allows conflicting private and public interests to be held in balance, it should not be used as a distraction from the fundamental policy issues that need to be addressed to meet the challenges of climate change.

It is further argued here that TRIPS may be positively beneficial to promoting CCT innovation and diffusion because it provides a substantive balance between minimum standards of protection and flexibilities in Member discretion. This balance, buttressed by a structured international legal regime, is helpful in avoiding barriers to innovation, enhancing the legitimacy of both patent holder and technology user interests, and promoting confidence and capacity building.

2. Key TRIPS provisions

2.1. General principles

TRIPS obliges WTO Members to respect certain minimum standards of intellectual property protection. As well as providing its own definitions and obligations, TRIPS applies the general principles of the Paris Convention.¹³ In addition, it contains two non-discrimination principles that are fundamental to trade law, the national treatment principle and the most-favoured-nation principle. Thus Members are obliged to accord treatment to the nationals of other Members that is no less favourable than the treatment accorded to its own nationals.¹⁴ Likewise, they must grant the same level of protection to all Members.¹⁵

TRIPS specifies rights that must flow from a patent. Patent holders may prevent others from making, using, offering for sale, selling, or importing the patented product or a product obtained by using a patented process without the consent of the patent holder.¹⁶ Patent owners also

have the right to assign or license their patents. These are significant powers, but they are restricted by the doctrine of exhaustion which means that patent rights over a particular product terminate after it has been distributed for the first time, for example after it is sold.¹⁷ In some jurisdictions, exhaustion only applies nationally or regionally so that patent holders can still control the release of their products in other markets. Other jurisdictions recognise international exhaustion, with the effect that a product which has been sold anywhere in the world can be resold in another national market without the patent holder's consent. The effect of international exhaustion is that it is possible to buy a product at its cheapest global price wherever that may be, rather than being forced to accept the price determined by the producer for a particular market. TRIPS does not provide any rule for exhaustion and it is therefore left up to national legal systems to determine, subject to MFN and national treatment provisions.¹⁸ This gives national governments flexibility which may help to reduce the purchase costs of patented products.

2.2. Criteria of patentability (Article 27.1)

TRIPS lays down a minimum set of criteria for patentability of novelty, inventiveness and the capacity for industrial application.¹⁹ Patentability extends to both products and processes, and to all fields of technology, and no discrimination between fields of technology is permitted. It is not clear, therefore, that a WTO Member is permitted to introduce patent rules that give preferential treatment to certain types of products or processes.²⁰

As to controlling patentability and the exercise of patent rights, however, there is greater flexibility. First, since implementation of the criteria occurs through national legislation, there is room for variation and choice. So, for example, it is

possible for countries to lay down stricter tests of novelty or inventiveness than other countries.²¹ Second, TRIPS provides some exceptions to the obligation to permit patentability even for products or processes that satisfy the basic criteria. These take the form of allowable exclusions and exceptions.

2.3. Exclusions from patentability

Members have the power to exclude patentability for certain inventions. Of these potential exclusions, the most relevant to CCT patents are those that refer to inventions where it is necessary to prevent commercial exploitation in order to protect *ordre public* or morality, including the protection of human, animal or plant life or health and the avoidance of serious prejudice to the environment.²² This has obvious implications for the use of IPRs and CCTs, but it is not clear precisely what those implications are. It has been argued, for example, that the wording of this provision allows Members to exclude IPR protection for climate change technology inventions on the grounds that they are designed to protect human, animal and plant life or health and to prevent serious prejudice to the environment.²³ However, the problem with this interpretation is that exclusion from patentability of inventions is only warranted where they might, if commercially exploited, lead to harm to human, animal or plant life or health or cause serious prejudice to the environment. It does not give permission to exclude patentability for inventions that are positively good for those things, as would presumably be the case for a CCT.

In addition, the morality exception has proven to be very difficult for patent offices to apply in practice. Patent offices, including the European Patent Office, have been cautious about taking responsibility for decisions of public policy. They are conscious that their role is to decide questions

of patentability, whereas the political institutions of each country are the most appropriate actors to consider arguments about whether an invention, patented or otherwise, should be allowed to be commercially exploited.²⁴

2.4. Exceptions to the exercise of intellectual property rights

There are several exceptions contained in TRIPS, of which the most relevant are contained in Articles 30, 31 and 40. Article 30 provides that Members may provide limited exceptions to the exclusive rights of patent holders. The grounds for these exceptions are not further defined, but are constrained by the need to ensure that they “do not unreasonably conflict with a normal exploitation of the patent and do not unreasonably prejudice the legitimate interests of the patent owner, taking account of the legitimate interests of third parties”.²⁵

This provision seems to suggest that patent rights over CCT inventions may be limited in the face of opposing interests, but the effect of this provision depends on the meaning given to those qualifying adjectives, “unreasonably”, “normal” and “legitimate”. They are commonly considered to cover uses for the purpose of research or private use but could be interpreted more broadly. However, this possible approach towards improving CCT transfer should be treated with caution. Enlarging the exception, for example by privileging environmental protection interests, runs the risk of removing the incentive for innovation. More fundamentally, using Article 30 to balance the relative importance of competing values gives a politically sensitive and inappropriate task to panels and the Appellate Body, and there is the practical problem of how dispute settlement bodies could be expected to evaluate different levels of climate change relevance, for example, whether an invention had been specifically designed to mitigate climate

change effects, whether reasonable alternatives already existed, and so on.

The second exception is contained in Article 31 which provides for compulsory licensing. Considerable attention has been paid to this provision, particularly since it became a controversial issue in the sphere of HIV/AIDS pharmaceuticals.²⁶ Briefly, Article 31 permits the authorisation of the use of patented products or processes against the rights of the patent holder and without their consent. This right to authorise is, as would be expected, carefully circumscribed. It must be done on a case-specific basis, which would probably exclude a blanket compulsory licensing of climate change inventions as a class.²⁷ An attempt should be made to come to a voluntary agreement for use on “reasonable commercial terms and conditions” within a reasonable period of time.²⁸ This requirement may be waived in cases of “national emergency or other circumstances of extreme urgency or in cases of public non-commercial use”.²⁹ It has been established that Members have the right to determine on what grounds the authorisation may be granted.³⁰ These grounds could include climate change effects, particularly if they are likely to be severe.

However, any use under a compulsory licence must be monitored and controlled to ensure that its scope and duration are limited to the purpose for which it was authorised. The use is non-exclusive and non-assignable, and can be terminated if circumstances change.³¹ In addition, the patent holder must be paid “adequate remuneration” relative to the economic value of the authorised use.³² This last provision suggests that compulsory licensing may not provide a better solution to the problem of access to cheap CCTs than a normal commercial license. However, the option of compulsory licensing would help to prevent unreasonable withholding

of patented products or processes, which might be important for ensuring that appropriate technology is widely available for use and encouraging research and development of new CCTs. For these purposes, at least, compulsory licensing may be extremely helpful.

However, Article 31 does have another limitation. It is designed to allow compulsory licensing predominantly to provide domestic supply for the authorising Member.³³ The emphasis on domestic supply is an important practical obstacle for countries without the domestic capacity to produce the patented products. This was the case for South Africa when it considered using compulsory licensing to obtain cheaper HIV/AIDS drugs for its own population.³⁴ After some controversy, the WTO General Council adopted the Declaration on the TRIPS Agreement and Public Health calling for an expeditious solution to the problem, followed by the decision on Implementation of Paragraph 6 of the Doha Declaration on the TRIPS Agreement and Public Health which waived the need to limit authorisation to domestic producers and the need to provide adequate remuneration.³⁵ An equivalent waiver for CCTs seems an attractive option for countries unable to pay the costs of patented CCTs, or who are facing unreasonable withholding of products or processes that would assist them in mitigation or adaptation.³⁶

However, a number of questions quickly arise. The first is whether the comparison between pharmaceuticals and CCT IPRs is based on a true analogy.³⁷ Climate change is an enormously diffuse problem, in its causes and potential solutions and in its transboundary impacts; HIV/AIDS drugs offer a specific solution to a specific problem, contained within specific markets. The problem in the case of pharmaceuticals was the danger of cheaply available drugs in one market being exported to

other markets where they could be sold at a higher price for profit.³⁸ Where CCTs would normally attract high prices in developed countries, this danger of parallel importing is likely to provoke resistance and challenges from CCT-producing countries if compulsory licensing is proposed. Resistance would be more likely because the techniques that make it possible to maintain some control over unauthorised use of drugs, such as packaging and product marking, would be more difficult to apply to CCTs because of their variety.

The third exception is contained in Article 40, which allows Members to control licensing practices or conditions on the use of intellectual property rights which have the effect of restraining competition, including cases where they may interfere with technology transfer.³⁹ It does not, however, cover other activities relevant to technology transfer, such as joint ventures or patent assignment. This provision is clearly drafted with commercial restrictive practices in mind, as suggested by the examples explicitly given, namely, “exclusive grantback conditions, conditions preventing challenges to validity and coercive package licensing”. Although these are examples and not intended to be exhaustive, they do indicate that the provision was not written with public policy problems such as climate change in mind. However, although it would be tendentious to suggest that patent rights that interfered with the use of CCTs were automatically ‘anti-competitive’, it is possible to imagine situations in which companies that held relevant patents might be found to be acting in an anti-competitive manner, for example, by refusing to grant licences to competitors.

2.5. Provisions relating to transfer of technology

TRIPS contains relatively few provisions that explicitly refer to technology transfer. According

to Article 7, the objectives of TRIPS are that “the protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations.”⁴⁰ This rather general provision is not of much assistance in determining how TRIPS should be interpreted or applied to promote the development and dissemination of CCTs. It neatly encapsulates the dilemma between the need to give incentives for CCT innovation and development through the opportunity to commercialise inventions, and the need to ensure that CCT products are rapidly and widely deployed without undue cost, practical difficulty or deliberate withholding. At best, Article 7 suggests that there must be a balance between the right to register and protect intellectual property and the need to have access to technology without excessive cost or difficulty.

However, TRIPS does require developed country Members to provide incentives to their enterprises and institutions “for the purpose of promoting and encouraging technology transfer to least-developed country Members in order to enable them to create a sound and viable technological base”.⁴¹ This is also unlikely to achieve concrete results on its own. In order to strengthen its effectiveness, the WTO Council adopted a decision in 2003 on the Implementation of Article 66.2 of the TRIPS Agreement to strengthen monitoring of this provision by providing for the provision and review of annual reports by developed country Members.⁴² Nonetheless, it has only an indirect effect on technology transfer by promoting incentives rather than imposing an obligation to transfer.

2.6. Interpretative guidance

As well as objectives, TRIPS lays down general principles. Article 8.1 provides that Members may adopt measures necessary to protect public health and nutrition, and to promote the public interest in sectors of vital importance to their socio-economic and technological development.⁴³ Article 8.2 provides that appropriate measures might be used “to prevent the abuse of intellectual property rights by right holders or the resort to practices which unreasonably restrain trade or adversely affect the international transfer of technology”.⁴⁴ However, these measures must be consistent with the provisions of the Agreement. It is evident, therefore, that the second part of Article 8 is not intended to grant an exception to the general obligation to protect patents.

It may be argued that Article 8 is simply a soft law provision designed to flag up the concerns of some of the negotiating Members, in this case developing countries, but equally it may be argued that it clarifies the right of Members to design their national intellectual property laws so as to give maximum protection for non-commercial public interests within the required minimum standards and non-discrimination principles. In the latter sense, Article 8 can be seen as a way of counterbalancing more extreme interpretations of TRIPS obligations in favour of patent rights.

Much will depend on the interpretation of the words “abuse”, “unreasonably” and “adversely”. Despite their soft nature, the principles stated in Article 8 and the objectives contained in Article 7 may potentially be used to give ‘colour, texture and shading’ to the interpretation of TRIPS as a whole.⁴⁵ This view is supported by the Declaration on the TRIPS Agreement and Public Health, which states that each provision should be read in the light of the object and purpose of

the Agreement “as expressed, in particular, in its objectives and principles”.⁴⁶ Additionally, the Panel in *Canada – Pharmaceutical Patents* recognised that Articles 7 and 8 must be ‘borne in mind’ when interpreting the meaning of Article 30.⁴⁷

3. Conclusions

TRIPS is often accused of being a key barrier to technology transfer of CCTs. On its face, it seems obvious that patent rights must increase costs and encourage obstructive practices even though there is an urgent need to deploy effective climate change measures. But studies so far suggest that the effect of patents on technology transfer varies depending on the sector and type of technology, and that most problems are to be found in particular situations such as patent thickets or wrongly granted patents.⁴⁸ If so, adjustments to the patents regime under TRIPS may not be necessary, but would in any case need to be specific rather than generalised if incentives to innovate are also to be preserved.

From a legal point of view, a review of TRIPS provisions suggests that there is a significant degree of open-textured or light touch regulation – in the language of TRIPS, there are flexibilities. Although minimum standards are laid down, and the complaints systems are powerful, there are substantive lacunae. Article 6 on exhaustion is only one example. As a result, national discretion as to what and how to legislate for IP protection is wider than it might first appear. There are also exclusions and exceptions that are available for Members to use.

It is likely that Article 7 will not be of significant use because of its generality and careful preservation of the balance between the competing interests of IPR holders and countries seeking favourable technology transfer arrangements. But it might affect the

interpretation of more specific provisions. A generous reading might allow preferential treatment for CCT patents which would otherwise be discriminatory. The *ordre public* or morality exclusions are unlikely to assist, despite their explicit reference to dangers to life and health and to serious prejudice to the environment, other than to enable the exclusion of harmful rather than beneficial inventions from patentability.

However, Articles 7 and 8 do give some interpretative opportunities, and the exceptions contained in Articles 30, 31 and 40 do contain useful flexibilities for the purpose of easing access to climate change technologies. None of them can be used for blanket overriding of patent rights, but the limited exception test in Article 30 may allow useful climate change work, such as using patented products or processes in the course of research and development. Even more powerful is the compulsory licence procedure, for which climate change mitigation or adaptation could be used as a ground for action. This would be balanced by the obligation to pay adequate remuneration and the limitation that production is limited to supply of a domestic rather than export market, unless there is sufficient political consensus to grant a waiver as occurred in the area of pharmaceuticals.

Arguably, therefore, TRIPS gives Members sufficient flexibility to cope with most barriers that patents may pose in climate change mitigation or adaptation policies, whether they are patent thickets, unreasonable withholding of licences or sale, or high costs. In addition, TRIPS can be seen as facilitating the development and transfer of CCTs. If patents are essential for providing incentives for innovation, then too radical a departure from intellectual property protection in general and TRIPS in particular will defeat the objective of developing and diffusing

climate change inventions. Equally, TRIPS offers a combination of predictability and flexibility, and the powerful dispute settlement process that supports it helps to maintain confidence on both sides. Without that confidence, transfer of CCTs might prove to be even more difficult to negotiate.

This is not to say that relying on market forces and regulatory intervention only when necessary will meet the urgent need to respond to climate change. A balance between the need to create incentives to innovate and the need to develop and diffuse climate change inventions in all countries, including developing countries, can also be attempted through parallel means, such as public funding of research or the purchase of patented products and processes by international institutions for dispersal in poorer countries. But it does mean that energy devoted to trying to emasculate TRIPS may be misplaced. For those that believe that patents have no place in the response to climate change, then TRIPS is the embodiment of international obligation and coercion that over-privileges intellectual property rights. It is a natural target. But for those who accept, reluctantly or otherwise, that patents do have a role to play, then TRIPS represents a promising legal and institutional balance for safeguarding the interests of patent holders and the effectiveness of public climate change policies.

*Professor of Law, Oxford Brookes University.

¹ Keith E Maskus and Jerome H Reichman, 'The Globalization of Private Knowledge Goods and the Privatization of Global Public Goods' 7 *Journal of International Economic Law* (2004) 279; Cameron Hutchison, 'Does TRIPS Facilitate or Impede Climate Change Technology Transfer into Developing Countries?' 3 *University of Ottawa Law and Technology Journal* (2006) 517. While it is evident that patent rights may give rise to barriers to trade and investment, through higher costs and hindrances such as patent thickets or wilful

obstruction, studies have also suggested that IPRs are a minor obstacle to technology transfer compared to reluctance to lose control over patentable technology, lack of capacity to absorb new technology due to limits on human resources, and access to credit or other forms of financing. See, for example, Thomas L. Brewer, 'Climate Change Technology Transfer: a new paradigm and policy agenda' 8 *Climate Policy* (2008) 516, 517. One study suggests that IP does not significantly affect the price that consumers of clean technology pay, but it does appear to make it more difficult for local industries to develop their own version or to innovate because of fears of patent infringement, see SPRU and TERI, UK-India Collaborative Study on the Transfer of Low Carbon Technology' (Phase II Final Report, March 2009), available at:

http://www.sussex.ac.uk/sussexenergygroup/documents/decc-uk_india_carbon_technology-web.pdf (accessed 17 July 2010). Recent literature emphasises the need to examine the impact of patents in specific sectors and technologies. See John Barton, 'Intellectual Property and Access to Clean Energy Technologies in Developing Countries' (ICTSD, December 2007); Keith E Maskus, 'Regulatory Standards in the WTO: comparing intellectual property rights with competition policy, environmental protection, and core labor standards' (2002) *World Trade Review* 135, 138-9; Jerome Reichman, Arti K Rai, Richard G Newell, and Jonathan B Wiener, 'Intellectual property and alternatives: strategies for green innovation', Energy, Environment and Development Programme Paper 08/03 (Chatham House, December 2008), available at: <http://fds.duke.edu/db?attachment-103--6101-view-766> (accessed 17 July 2010); Bernard Hoekman, Keith E Maskus, and Kamal Saggi, 'Transfer of technology to developing countries: Unilateral and multilateral policy options' 33(10) *World Development* (2005) 1587.

² Dispute Settlement Understanding, GATT Secretariat, *The Results of the Uruguay Round of Multilateral Trade Negotiations, the Legal Texts* (Geneva, 1994) 353.

³ ICTSD, *Climate Change, Technology Transfer and Intellectual Property Rights* (Trade and Climate Change Seminar, June 18-20 2008, Copenhagen (Winnipeg, August 2008), available at: http://www.iisd.org/pdf/2008/cph_trade_climate_tech_transfer_ipr.pdf (accessed 17 July 2010); Estelle Derclaye, 'Should Patent Law Help Cool the Planet? An Inquiry

From the Point of View of Environmental Law: Part 2' (2009) *European Intellectual Property Review* 227.

⁴ Dieter Helm, 'Climate-change Policy: Why has so Little been Achieved?' in Dieter Helm and Cameron Hepburn (eds), *The Economics and Politics of Climate Change* (Oxford University Press, 2009), 12-14.

⁵ Rio Declaration, Principle 9; UNFCCC, particularly Article 4(5); Kyoto Protocol, Article 10; Bali Action Plan; Copenhagen Accord, paras 3, 8, 10 and 11.

⁶ Note the ongoing research project by UNEP, EPO and ICTSD to try to formulate an objective system of classification, project description at <http://www.unep.ch/etb/initiatives/pdf/ESTsProject%20Description1.pdf> (accessed 17 July 2010).

⁷ In this paper, the phrase climate change technology is used to refer to goods that may be used for climate change mitigation or adaptation.

⁸ Other relevant intellectual property rights would include trademarks and industrial designs.

⁹ In the case of mitigation policies, incentives are found in carbon pricing and patents. It is assumed by most commentators that incentives are required in order to promote the development and diffusion of environmentally friendly technologies, and that public funding of research and development will be swamped by the costs and difficulty of changing the dominant paradigm of carbon-intensive production; IPRs are therefore considered to be an inevitable part of providing incentives to private actors. Where adaptation policies also require technological solutions, for example genetically engineered crops or desalination processes, incentives to innovate will also be found by the granting of patents. Although the drivers of conventional carbon-intensive production may be absent, the need to promote innovation will remain. I am grateful to Professor Thomas Cottier for raising the point that mitigation and adaptation policies will face different impacts from the existence of patents.

¹⁰ See ICTSD, above n 3. Although there is some controversy over these points, they will not be further considered here. For further discussion elsewhere, see above n 1.

¹¹ There are other types of solutions that could be devised, including expropriation, publicly paid flat fees, public investment in research and development with no

opportunities for private commercialisation, publicly paid royalties, and so on. See Reichman et al, above n 1; Heleen de Coninck, Carolyn Fischer, Richard G Newell and Takahiro Ueno, 'International Technology-Oriented Agreements to Address Climate Change' 36 *Energy Policy* (2008) 335.

¹² A point noted by other commentators, see Daniel Gervais, 'Of Clusters and Assumptions: Innovation As Part of a Full TRIPS Implementation' 77 *Fordham Law Review* (2009) 2353, 2355-61.

¹³ Paris Convention for the Protection of Industrial Property 1883 828 U.N.T.S. 305, revised 1967, available at http://www.wipo.int/treaties/en/ip/paris/trtdocs_wo020.html (accessed 17 July 2010). The Paris Convention has 173 parties, and covers industrial property in a wide sense to include patents, industrial designs, trademarks, marks of origin and unfair competition. Its patent provisions guarantee the right to national treatment within the member countries, and an application in one party gives the inventor a right of priority to file in other member countries. However, patents are considered to be 'independent', meaning that each party may apply their own patent laws. TRIPS Article 2 requires Members *inter alia* to comply with Articles 1-12 and 19 of the Paris Convention.

¹⁴ Article 3.

¹⁵ Article 4.1 states, *inter alia*: "With regard to the protection of intellectual property, any advantage, favour, privilege or immunity granted by a Member to the nationals of any other country shall be accorded immediately and unconditionally to the nationals of all other Members."

¹⁶ Article 28.1.

¹⁷ See Christopher Heath, "Parallel Imports and International Trade" (WIPO: June, 1999) available at http://www.wipo.int/edocs/mdocs/sme/en/atrip_gva_99/atrip_gva_99_6.pdf (accessed 17 July 2010)

¹⁸ Article 6. This was reinforced by the Doha Declaration, para 5(d).

¹⁹ This is subject to a transition period for countries that are required to extend intellectual property protection to areas of technology not protected prior to the adoption of TRIPS, see Article 65.4.

²⁰ See Estelle Derclaye, 'Patent Law's Role in the Protection of the Environment – Re-assessing Patent Law

and Its Justifications in the 21st Century' (2009) International Review of Intellectual Property and Competition Law 249, 269-72; Itaru Nitta, 'Proposal for a Green Patent System' 5 Sustainable Development Law and Policy (2005) 61.

²¹ Jerome H Reichman, "Universal Minimum Standards of Intellectual Property Protection under The TRIPS Component of the WTO Agreement" in Carlos M Correa and Abdulqawi A Yusuf (eds), *Intellectual Property and International Trade: The TRIPS Agreement* (Kluwer Law International, 1998) 21.

²² Article 27.2. Note that there is an explicit condition that such exclusions are not to be used merely because they already exist in national law. The other exclusions relate to diagnostic, therapeutic and surgical methods for the treatment of humans or animals, and to biotechnological inventions and plant variety protection, see Article 27.3.

²³ Matthew Rimmer, 'The Road to Copenhagen: Intellectual Property and Climate Change' 4 Journal of Intellectual Property Law and Practice (2009) 784, 786-7.

²⁴ *Harvard/Onco-Mouse*, Case T 315/03 EPO Board of Appeal, July 2004; *Plant Genetic Systems*, Case T 0356/93 [1995] EPOR 357.

²⁵ Article 30.

²⁶ Rachel Roumet, 'Access to Patented Anti-HIV/AIDS Medicine: the South African Experience' 32 European Intellectual Property Review (2010) 137; F M Abbott and J H Reichman, 'The Doha Round's Public Health Legacy: Strategies for the Production and Diffusion of Patented Medicines Under the Amended TRIPS Provisions' 10 Journal of International Economic Law (2007) 921; B C Mercurio, 'TRIPS, Patents, and Access to Life-Saving Drugs in the Developing World' 8 Marquette Intellectual Property Law Review (2004) 211.

²⁷ Article 31(a).

²⁸ Article 31(b).

²⁹ Article 31(b).

³⁰ Doha Declaration, para 5(b) and (c).

³¹ Article 31(c)-(e) and (g).

³² Article 31(h). See Antony Taubman, 'Rethinking TRIPS: 'Adequate Remuneration' for Non-Voluntary Patent Licensing' 11 Journal of International Economic Law (2008) 927.

³³ Article 31(f).

³⁴ Above n 26.

³⁵ WT/MIN(01)/DEC/2, 20 November 2001 and WT/L/540 and Corr.1, 1 September 2003, respectively. The waiver has now been made permanent by the Protocol amending the TRIPS Agreement, WT/L/641, 8 December 2005.

³⁶ Indeed, the European Parliament has called for an equivalent waiver from the WTO for the purposes of climate change. European Parliament resolution of 29 November 2007 on trade and climate change 2007/2003(INI).

³⁷ Alexander Adam, 'Technology Transfer to Combat Climate Change: Opportunities and Obligations under TRIPS and Kyoto' 9 Journal of High Technology Law (2009) 1, text at nn 131-41.

³⁸ This is the problem of so-called parallel importation or 'grey markets'. See Christopher Heath, above n 17.

³⁹ Article 40.

⁴⁰ Article 7.

⁴¹ Article 66.2.

⁴² IP/C/28.

⁴³ Article 8.1.

⁴⁴ Article 8.2.

⁴⁵ The quote is from WTO Appellate Body Report, *United States - Import Prohibition of Certain Shrimp and Shrimp Products (US - Shrimp)*, WT/DS58/AB/R, adopted 6 November 1998, para 153, referring to the interpretative role of the preamble of the WTO Agreement.

⁴⁶ Doha Declaration, para. 5(a).

⁴⁷ Panel Report, *Canada - Patent Protection of Pharmaceutical Products*, WT/DS114/R, adopted 7 April 2000, para 7.26.

⁴⁸ Above n. 1.

Intellectual Property Rights (IPR) – Another Untested Hurdle in Copenhagen

*Marianne Levin**

Among the emerging issues concerning longer-term intellectual property (IP) developments belongs the relationship between IP rights and environmental degradation. Looking back at the relations between IP and possible transfers of environmentally sound technologies (ESTs), indeed not very much has been said about IP in the climate context – until recently, before the COP 15 in Copenhagen 2009, where many and strong arguments were put forward from developing countries to limit the patentability of climate-related patents and to open up the WTO Agreement on Trade-Related Aspect of Intellectual Property rights (TRIPS). There may be good reasons for opening up TRIPS, but this is not so easy, and it is doubtful whether the negotiations on climate change are the right forum. TRIPS says little about environmental concerns. Thus, any agreement on IP and climate change seems to be better placed in the UN than in the WTO, which does not contradict future cooperation on related matters.

1. IPR and the new interfaces

The Agreement on Trade-related Aspects of Intellectual Property Rights (TRIPS) seems to have been a catalyst provoking a shift in perspective and marking a new form of discourse on Intellectual Property (IP),¹ which is characterized by on the one hand, power of companies and markets, and on the other, a number of moral and human rights issues such as globalization, sustainable development and public health.² IP laws are now subject to a much wider public scrutiny than in the past, and it is likely they can no longer be developed under the radar of public consciousness.³ The growing awareness of IPR at all levels has not only challenged the system but also pressed forward some important statements during the last years,

including a public health amendment to TRIPS,⁴ the progress of a World Intellectual Property Organization (WIPO) Development Agenda⁵ and the recent adoption by the World Health Organization (WHO) of a Global Strategy on public health, innovation and intellectual property.⁶ In other instances, challenges to TRIPS are framed through reinterpretation of existing agreements and the creation of nonbinding declarations, recommendations and other forms of soft law.⁷ All these developments have been intensely ventilated in the academic discourse on TRIPS, as well as by states and non-governmental organizations (NGOs) in forums such as WIPO, The World Trade Organization (WTO), WHO and the Conference of the Parties to the Convention on Biological Diversity (CBD).⁸ Among the emerging issues concerning longer-term IP developments belongs the relationship between IP and environmental degradation, or climate change.⁹ Positions held in this area by developed and developing countries do not differ very much from the ones in other international discussions, but contrary to in most other IP negotiations, the emerging economies China and India have clearly chosen the side of developing countries.

2. IPR and Climate Change an ambiguous relation?

As scientific projections suggest, we have only experienced the earliest stages of a growing and complex environmental crisis,¹⁰ and climate change problems have advanced to one of the hottest subjects in our time. As may be recalled,

Agenda 21 agreed at the Rio Summit in 1992 concluded that a large body of useful technological knowledge lies in the public domain.¹¹ But to the extent that this is not the case, the Agenda urged governments and international organizations to promote, and to encourage the private sector to promote, effective modalities for the access and transfer,¹² in particular, to developing countries of environmentally sound technologies (ESTs).¹³ This can be done by *e.g.* enhancing the access to and transfer of patent protected ESTs, and purchasing patents and licences on commercial terms for their transfer to developing countries on non-commercial terms toward the aim of sustainable development, taking into account the need to protect IP.¹⁴

Even if the declared aim of the Uruguay Round of General Agreement on Tariffs and Trade (GATT) in 1986 to 1994 was to narrow the gaps between IP laws in various parts of the world,¹⁵ the TRIPS text is in fact based on Northern norms, due to the fact that the Uruguay Round negotiations were driven by a USA-EU-Japan-Swiss alliance.¹⁶ TRIPS has not only made IP protection globally standardized at a developed country minimum level but also strengthened the system as such. Since TRIPS, there has been a particular focus on the role of IP as a barrier to the international diffusion of technologies to developing countries,¹⁷ and especially to least developed countries (LDCs).¹⁸ Even though, at least to date, evidence of serious impediments have been referred to as 'anecdotal', and it is rather the level of tacit knowledge not covered by IPR that may prevent effective transfer of ESTs,¹⁹ the effects of strong intellectual IP protection and proprietary licensing have been criticized as impeding access to *e.g.* renewable energy technology.

Notwithstanding the unclear role IP in the climate context and the lack of and empirical data for informed and objective decision-making,²⁰ this critical attitude may be a crucial hurdle at any future negotiations of a revised UNFCCC and Kyoto Protocol,²¹ and risks to become the next big IP confrontation after medicines. While access to medicine is important, because it concerns many, especially in the developing world, clean water, clear air and a stable climate concern everybody. Thus, if IP *may be a negative influence in the range of policy initiatives that are needed to deal with climate change* and impede access to climate technologies there might be a very strong case against IP protection. On the other hand, quantitative and qualitative analysis finds that patents have not yet mounted to a significant barrier to access in developing countries.²² Instead, there are arguably a number of potential social and economic benefits from a strong IP system, such as:²³ increased innovation; innovators reap the fruits of their creative labour and influence how their technology is used; public disclosure as a requirement for exclusive rights; and assurance for investors to recapture their investment in a protected technology...²⁴

Even though these benefits can be better exploited by developed countries,²⁵ and the mere existence of IPR does not make people invent or invest,²⁶ or even guarantees or suffices for effective transfer of technology, arguably caution should be exercised in advocating changes that would weaken the established IP system as such.²⁷ Notably, this statement does neither contradict that a functioning IP system has to be well-calibrated, nor that there may appear unbalances as results of technological developments and uneven negotiating powers that need adjustments.²⁸ It was also clear from the Ad hoc Working Group report on Further Commitments for Annex I Parties under the Kyoto Protocol and the report on Long-term

Cooperative Action under the Convention that the existing IP system basically is satisfactory and *status quo* should be maintained.²⁹ IP is, at least in part, an instrument aimed at facilitating transfer of technology,³⁰ and TRIPS also contains provisions to prevent the abuse of IP rights by right holders or the resort to practices which unreasonably restrain trade or adversely affect the international transfer of technology.³¹ This could be important to developing countries, with often inferior regulations of unfair competition law.³²

Sharing knowledge, like minimising CO₂ emissions, is considered by many to be essential to achieving a fair balance between rich and poor countries, between industry and consumers and between large corporations and SMEs.³³ Notwithstanding the fact that some examples could be found where IP arguably has blocked access to substitutes,³⁴ and there might exist limitations with respect to specific technologies such as key existing mitigation technologies,³⁵ where public-private partnerships could be less suitable for buying IP, so far no clarity exists on where IP may prevent access to ESTs and hinder the protection of a public good.³⁶ But if this were the case, there are indeed good reasons for the international community to react.

Since 1972 it has been accorded that ESTs should be made available to developing countries on terms which would encourage their wide dissemination without constituting any economic burden on the developing countries.³⁷ This was reaffirmed at the creation of the UNFCCC in Rio 1992, where *e.g.* Arts. 4.1, 4.3 and 4.5 talk about transfer of technology. And even if IPR as such were not mentioned, this does not mean that IPR were not thought of. Agenda 21 of the Rio Summit states that,³⁸

Consideration must be given to the role of patent protection and IPR along with an examination of their impact on the access to and transfer of ESTs, in particular to developing countries, as

well as to further exploring efficiently the concept of assured access for developing countries to ESTs in its relation to proprietary rights with a view to developing effective responses to the needs of developing countries in this area.

It is also clear from Agenda 21 that the objective must be:³⁹

To promote, facilitate, and finance, as appropriate, the access to and the transfer of ESTs and corresponding know-how, in particular to developing countries, on favourable terms, including on concessional and preferential terms, as mutually agreed, taking into account the need to protect IPR, as well as the special needs of developing countries for the implementation of the Agenda.

In regard of privately owned technologies, the following measures should be adopted, in particular for developing countries:⁴⁰

Purchase of patents and licences on commercial terms for their transfer to developing countries on non-commercial terms as part of development cooperation for sustainable development, taking into account the need to protect IP;

In compliance with and under the specific circumstances recognized by the relevant international conventions adhered to by States, the undertaking of measures to prevent the abuse of IPR, including rules with respect to their acquisition through compulsory licensing, with the provision of equitable and adequate compensation.

In June 1997 the UN General Assembly expressed that the international community should promote, facilitate and finance, as appropriate, access to and transfer of ESTs and the corresponding know-how, in particular to developing countries, on favourable terms, including concessional and preferential terms, as mutually agreed, taking into account the need to protect IPR as well as the special needs of developing countries for the implementation of Agenda 21.⁴¹ In this context, it is important to identify barriers and restrictions to the transfer of publicly and privately owned ESTs, with a view to reducing constraints for the transfer of such technologies.

In COP 7 of the UNFCCC (2001) the protection of IP was specifically identified as one of the means of creating an enabling environment, as well as providing access to publicly funded technologies.⁴² This was again taken up in the Bali Road Map,⁴³ with a recommendation to encourage parties to avoid trade and IPR policies, or lack thereof, 'restricting transfer of technology'. Existing vehicles and new initiatives should help enabling environments for technology transfer; and licences to support the access to and transfer of low-carbon technologies and know-how. This led up to the Bali Action Plan, of March 2008 where the exchange of views among Parties on financial and technological cooperation and support that had addressed general principles to guide governance and action with a diversity of ideas and proposals regarding means of generating and delivering substantial new and additional finance, including facilitation of access, and the design of effective institutional arrangements for finance and technology transfer. With technology as a key component, attention was also given to the potential for technological cooperation, including cooperative research and development and ways of dealing with the issue of IPR.⁴⁴

In the light of the progress of discussions on the Bali Action Plan,⁴⁵ the Ad Hoc Working Group on Long-term Cooperative Action at its fifth session, apart from generating substantial new and additional finance, and design of institutional arrangements for finance and technology under the UNFCCC, recommended also on cooperative research and development of new technologies and focus on IPR for existing ones. A comprehensive process should enable the full, effective and sustained implementation of the UNFCCC through long-term cooperative action by addressing:⁴⁶

- *The contribution of existing TRIPS flexibilities to climate-related technology transfer, which could be significant*
- *The provisions of TRIPS that could be used to promote such transfer of technology, and*
- *Possibly also additional measures to ensure that IPR support the climate regime.*

Thus, the Bali Action Plan recommended increased research and analysis on:

- *The links between transfer of technology and IPR to overcome apparent differences and to develop effective technology-related international cooperative action on climate change;*
- *The relationships between IPR and the transfer of climate-related technologies and to outline some of the existing and prospective; and*
- *Measures in TRIPS to be considered in support of a post-Kyoto climate regime.*

These types of studies are now made in an intensified frequency, e.g. under the auspices of the ICTSD, the OECD, the WIPO and the World Bank. And also if such further research will be critical to give any effective solutions,⁴⁷ an overview of the potential opportunities and challenges presented by international IP rules to technology transfer under the post-2012 climate regime can still be expected to present important lessons for possible next steps both in the UNFCCC and in the WTO.⁴⁸

To sum up and looking back at the relations between IPR and possible transfers of ESTs, indeed not very much has been said about IP in the climate context – until recently before the UNFCCC COP 15 in Copenhagen 2009. The closer the Copenhagen meeting came, the more

positions were hardening. On the side of developing countries many and strong arguments were presented to limit the patentability of climate-related patents and to open up TRIPS. On the side of developed countries, e.g. the U.S. Congress issued a directive that any new climate treaty cannot limit the scope or exercise of American IPR, while some developing countries pushed for strong language on compulsory licensing or even exclusion of ESTs from patentability.⁴⁹ Obviously, such politicised claims can hardly proactively serve present or future climate discussions.

3. So what is in TRIPS?

Originally, international IPR were mainly discussed in the WIPO and foremost as a legal technological matter. Today, TRIPS as part of the WTO package solution is the primary and most comprehensive global IP treaty, and its (new) ‘trade-related dimension’⁵⁰ seems to have given free room for political jockeying in present discussions, including in the context of the UNFCCC. Around 75 percent of the parties to the UNFCCC are also – willingly or unwillingly⁵¹ – parties to TRIPS. Notably, the objective of TRIPS framed in Art. 7 is not only to protect IPR, but also to promote the transfer and dissemination of technology to the mutual benefit of producers and users of technological knowledge:

The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations.

3.1 TRIPS flexibilities

Furthermore, under Art. 8 TRIPS, members may enact laws and regulations to ‘protect public health and nutrition’ and to ‘promote the public interest in sectors of vital importance to their

socio-economic and technological development’, as long as such measures conform to the terms of the Agreement. In addition, specific TRIPS provisions allow some flexibility, e.g.:

- Art. 27.1 on criteria for patentability;
- Art. 27.2 on patentability exclusions;
- Art. 30 on exceptions to exclusive rights;
- Art. 31 on compulsory licensing; and
- Art. 40 on control of anti-competitive practices in licenses.

The use of these flexibilities has not proved easy in other areas,⁵² but how far-reaching the flexibilities are in practice has only been tried in a few cases. Even if so far the WTO-TRIPS panels rather have confirmed the monopolistic strength of IP right holders with absolute powers in most respects,⁵³ there is no evidence of such obstacles in the climate change context.⁵⁴ Eventually, this could probably depend on economic and political power distribution and the involvement of NGOs and other stakeholders,⁵⁵ and last but not least whether IPR really form a threat to positive climate solutions. The assumption must be that balancing of interests; not only within the IP system but also weighting the objectives of IP law against larger societal and economic welfare interests, including a sustainable development, are required and in the interest of all actors. This should arguably also follow from a loyal interpretation of TRIPS.

3.2 Provisions designed to address the environmental concerns

In the climate change context Art. 27.2 TRIPS can be seen as a confirmation of a certain environmental awareness by the legislator at the time, as prejudice to the environment is regarded as part of ‘ordre public’:

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

This provision, which is also repeated in recital 29 to the Directive on biotechnological patents,⁵⁶ has never been tried by a WTO Panel. But from a European perspective the Boards of Appeal of the European Patent Office observed that:⁵⁷

It is generally accepted that the concept of 'ordre public' covers the protection of public security and the physical integrity of individuals as part of society. This concept encompasses also the protection of the environment to breach public peace or social order (for example, through acts of terrorism) or to seriously prejudice the environment. Accordingly, under Article 53(a) EPC, inventions the exploitation of which is likely are to be excluded from patentability as being contrary to 'ordre public'.

However the in-built 'necessary test' requires that the purpose of an overriding social interest be objectively justified when addressing a possible exclusion, and there could be clashes in the interpretation. Though TRIPS constitutes the *lex specialis* for dealing with patent issues in the WTO framework, the GATT/WTO jurisprudence on Art. XX of GATT is likely to play a role in the interpretation of Art. 27.2. In the India- Patent Protection for Pharmaceutical and Agricultural Chemical Products case (WT/DS50) the Panel, on the one hand, held that,⁵⁸ TRIPS has a 'relatively self-contained, *sui generis* status within the WTO'. On the other, the Panel also held that the Agreement is 'an integral part of the WTO system, which itself builds upon the experience of over nearly half a century under the GATT 1947'.⁵⁹ Before that background, the risk of being hauled up before a WTO dispute panel may discourage a member from making use of this provision.⁶⁰

For ethical or other reasons, members can also exclude plants or animals from patentability, subject to certain conditions. Thus, under Art. 27.3 TRIPS members can make certain inventions ineligible for patenting, if believed that the invention has to be prevented (within the territory) for these and certain other objectives.

3.3 Provisions in TRIPS for Technology Transfer

Apart from Arts. 7 and 8.2 TRIPS, Art. 66.2 on LDCs states that:

Developed country Members shall provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to least-developed country members in order to enable them to create a sound and viable technological base.

These weak and diffuse obligations do not bring much of practical commitments. So, it might be symptomatic that the European Commission issued a paper in September 2007 reminding Member States that the deadline for notifications on developed countries reports on their technology transfer incentives for the implementation of Article 66.2 TRIP on an annual basis had passed.⁶¹ In reality, fairly little has been done by developed countries to provide concessions to developing countries and to provide incentives to/impose obligations on enterprises and institutions to disseminate or transfer technology.⁶²

3.4 Provisions in TRIPS for compulsory licensing

Under Art. 31 TRIPS each country has the right and discretion to grant compulsory licenses and the right to determine what constitutes national emergency or other circumstances of extreme urgency. The 2001 Doha Declaration on TRIPS and Public Health has clarified the flexibility afforded by TRIPS to member countries in setting IP protection with respect to pharmaceutical

patents in a public health crisis afflicting a poor country or other urgent national concerns. When in such an emergency situation a poor country is lacking the manufacturing capacity, a waiver should enable the export of a pharmaceutical produced under a compulsory license to a destination where it is critically needed.⁶³ But the scope is limited to precisely that.

4. Trying to sum up the IP situation

The question whether special IP arrangements in the context of climate change are needed remains open.⁶⁴ But it has been argued that the increasing public attention and concerns for the relationship between IP and the transfer of ESTs call for measures and adjustments to TRIPS to support the post-Kyoto climate regime – to the extent that TRIPS flexibilities would not already be sufficient to allow international IP rules to support the rapid and widespread transfer of technologies needed for climate change mitigation and adaptation.⁶⁵ According to the UN Economic and Social Affairs (DESA)(reference), the climate change problem has the status of a global emergency in the vein of current epidemics, why DESA claims that the Doha Declaration should apply analogously.

Apart from the mentioned Art. 27.2, TRIPS says little about environmental concerns. Contrary to the field of health or nutrition, TRIPS does not provide for any special treatment or flexibilities for access to and dissemination of ESTs.⁶⁶ Arguably, neither Art. 31, nor the Doha waiver for pharmaceuticals (or other urgent national concerns mentioned in the Doha Declaration) brings any solution to transfer of technology in the general climate context. There exists no such waiver for any other products than pharmaceuticals, and there is no overlap between these and ESTs. Thus, a country trying to set up a compulsory license to export an environmental good or service to a developing country will most

probably violate WTO rules.⁶⁷ Furthermore, in light of the long-winded procedures to reach a decision on TRIPS and public health and the uncertain scope of the Doha flexibilities, no general ‘analogue application’ seems probable. In addition, it also seems difficult to more precisely identify those inventions that should merit for such a special treatment, if it is not by the initiative of the right holders.⁶⁸ This does not contradict that workable solutions are required if IP shows to be of hindrance to crucial technology transfer,⁶⁹ and in such a scenario, IPR should not be allowed unduly to hinder transfers.⁷⁰ But arguably, this is not equal to free IP or a ban on patents, nor is it consistent with the Rio Summit.

With the goal to create an IP regime that provides incentives for technological innovation and its global diffusion and usage, both whip and carrot might be needed. Even if so far a majority of ESTs have not been patented, tendencies to increased patenting in the green area are now visible,⁷¹ and also supported: The UK patent Office has, for instance, recently introduced a Green Channel for patent applications.⁷² This service allows applicants to request accelerated processing of their patent application if the invention has an environmental benefit. One could well argue that IP as a barrier to free competition must be tolerated only to the extent necessary to encourage technological progress.⁷³ Thus, the encouragement of open-source models for the supply of a ‘global public good’ such as ESTs should be given special attention.⁷⁴ Developments such as the ECO Patent Commons⁷⁵ could be one solution to meet the growing energy demands of developing countries in a sustainable fashion.

In addition to big companies’ willingness to contribute on a voluntary basis, it must always be acknowledged that the possible success of the climate change programme is very much

dependent on big funding, including enhancing capacity building, as well as installing and improving ESTs in developing countries. Without IP being acknowledged and respected, such activities, as well as R&D are likely to be low and deprived of financial incentives from the (industrialized countries) governments as well as private investors, especially in times of financial crises. It is indeed difficult to envisage EU, Japan and the USA 'selling out' IP, even in this urgent context.⁷⁶ But the same goes for China, one of the Top Ten on the world patent ranking list. Therefore, the active role of China and India in the lead of the developing countries for free access to IP-protected ESTs and other earlier disputed TRIPS-related IP seems more of a power game, where IP is being used as a tool in big politics rather than being the main focus. For an IP lawyer, it is to regret that IPR once more seem to have become a political chip, this time in the UNFCCC, rather than using the system to solve climate problems in a constructive manner! But this was never put to an edge.

Developed countries are in favour of a strong IP system because it fosters economic growth. The private sector should be encouraged to continue to extend the benefits of new technologies by entering into mutually beneficial arrangements with foreign joint venture partners. From this follows that foreign investors in developing countries with stronger IP regimes are more likely to engage in local production, rather than focus solely on setting up distribution networks.⁷⁷ Some research results indicate that countries with high per capita incomes probably grow more rapidly with strong IP rights. On the other hand, there is no evidence that stronger IP protection reduces growth in the poor countries, while middle-income countries may have offsetting losses from reduced scope for imitation.⁷⁸ Evidence is even less conclusive in the case of foreign direct investments (FDI).⁷⁹ However, an

important component of any program to attract high-quality FDI and technology transfer seems to be the development of a competent indigenous technological capacity.⁸⁰ If indigenous knowledge is perceived to be incapable of contributing to technological advancement,⁸¹ it just risks to be distanced from economic recognition and be made a victim of rent-seeking behaviour.⁸²

When advanced developing countries such as China and India seek support for (free) ESTs to meet their growing energy requirements, this support could take many forms, such as joint R&D efforts, shared IPR, and foreign funding for energy infrastructure. The worst situation is, as always, for those countries that do not attract FDI, the LDCs. But with the risk of being cynical, in the present climate change context, solving the IP problems of the LDCs seems less urgent. These countries are neither the greatest emitters, nor will IP in the one or the other direction probably make any big difference. It is important to recall that IPR are only one among many other factors which may impact technology transfer. Other factors such as the enabling environment, in particular financing, adequate incentives and institutions play a more important role.⁸³

Finally, it is open to question where the relation between transfer of ESTs and IPR best should be handled. On the one hand TRIPS is binding in another way than UN documents. But on the other, amendments to TRIPS, even if possible, have shown to be cumbersome. The Doha talks are not finalized and the health waiver of the Doha Declaration is still not, after nine years, ratified by a sufficient number of members to enter into force. Even though a majority of parties to the UNFCCC also are parties to TRIPS and even though the UN system offers a weaker framework in regards of enforcement of treaty obligation, any agreement on IP and climate change seems to be better placed in the UNFCCC.

This could also probably enhance cooperation between the UN and the WTO in these matters.

*Professor, LL.D., Ph.D. *h.c.*, Department of Law, Stockholm University. Extended version of a paper given at the Conference REGULATING GLOBAL CONCERNS, CLIMATE CHANGE AND INTELLECTUAL PROPERTY RIGHTS: Legal Frameworks and Institutions for the Development and Transfer of Environmentally Sound Technologies, 11-12 May, 2010, Sandbjerg Estate, Sønderborg, Denmark.

¹ In short: a number of distinct types of creations of the mind for which property rights are recognised. Common types include copyrights, industrial designs, patents, trade marks, and under some jurisdictions also trade secrets. Under IP law, owners are granted certain exclusive rights. Limitations in time and of other aspects of IP arguably make these monopoly rights useful to society. At least, this has been the established view in a market economy.

² Cf. Ghafele, Roya, *Perceptions of Intellectual Property*, August 2008, 31, at <http://www.iam-magazine.com/blog/articles/PerceptionsofIP.pdf>

³ Halbert, Debora, *Redefining TRIPs in the Face of Global Change*, Paper presented at the annual meeting of the International Studies Association, Hilton Hawaiian Village, Honolulu, Hawaii, 5 March 2005, 7, who argues that the current resistance staged by transnational activists anyhow will require a more serious consideration of issues of social justice and global equity within TRIPS, at http://www.allacademic.com/meta/p_mla_apr_research_citation/0/7/0/6/8/pages70689/p70689-6.php

⁴ Cf. para. 6 of the Doha Declaration on the TRIPS Agreement and Public Health of 14 November 2001, and the following 2005 Ministerial Declaration.

⁵ The Development Agenda, formally adopted by WIPO's General Assembly, 10 October 2007 with a set of [45 recommendations](#) to enhance the development dimension of the Organization's activities. The further work on the six clusters of recommendations is handled by a [Committee on Development and Intellectual Property](#) (WIPO CDIP). The fifth session of the CDIP ended on 30 April 2010 with a significant breakthrough: delegates agreed on a coordination mechanism for the

implementation of the Agenda; see for details at http://www.wipo.int/meetings/en/details.jsp?meeting_id=19686

⁶ Sixty-first World Health Assembly, 24 May 2008, at <http://www.who.int/mediacentre/events/2008/wha61/en/index.html>

⁷ Helfer, Laurence R. *Mediating Interactions in an Expanding International Intellectual Property Regime*, *Case Western Reserve Journal of International Law*, Vol. 36, Fall 2004, 6, at SSRN: <http://ssrn.com/abstract=578121>

⁸ Helfer, 6-7.

⁹ Cf. e.g. Stern, Nicholas, *The Economics of Climate Change*, (The Stern Report) Cabinet Office/HM Treasury, Cambridge University Press 2006, Part IV, 10 *et seq.*, at <http://snipurl.com/11fp8>; and Copenhagen Economics, *Are IPR a Barrier to the Transfer of Climate change Technology?*, report prepared for the European Commission on the importance of intellectual property rights as a barrier to transfer to developing countries of technology which reduces emissions of carbon dioxide (2009), at http://trade.ec.europa.eu/doclib/docs/2009/february/tradoc_142371.pdf, or at <http://www.copenhageneconomics.com/Publications/Impact-Assesment.aspx>

¹⁰ Intergovernmental Panel on Climate Change (IPCC), <http://www.ipcc.ch/>

¹¹ Para 34.9.

¹² IPCC 2002 defines "transfer of technology" as 'the broad set of processes covering the flows of knowledge, experience and equipment amongst different stakeholders such as governments, private sector entities, financial institutions, NGOs and research/educational institutions. The broad and inclusive term "transfer" encompasses diffusion of technologies and technology cooperation across and within countries. It comprises the process of learning to understand, utilise and replicate the technology, including the capacity to choose it and adapt it to local conditions. Cf. the Draft International Code of Conduct on the Transfer of Technology (1985).

¹³ *I.e.* technologies that: protect the environment, are less polluting, use all resources in a more sustainable manner, recycle more of their wastes and products, and handle residual wastes in a more acceptable manner than the

technologies for which they were substitutes, *cf.* Arts. 4.5 and 4.7 UNFCCC.

¹⁴ Ch. 34 para. 34.18 e (ii) and (iii).

¹⁵ Marinova, Dora & Raven, Margareth, *Indigenous Knowledge and Intellectual Property: A Sustainable Agenda*, (2006) *Journal of Economic Surveys*, Vol. 20, No. 4, 597, at <http://www3.interscience.wiley.com/cgi-bin/fulltext/118583570/PDFSTART>.

¹⁶ Negotiators came from an initial group of about 20 countries, increasing over time to about 30 of which about half came from industrialized countries. The negotiators from developing countries however had the disadvantage of not being familiar with IP or even law, see further Gervais, Daniel, *The State of Play*, *Fordham Law Review* Vol. 74, 2005, 506, at SSRN:

<http://ssrn.com/abstract=870065>.

¹⁷ Walker, Simon, *The TRIPS Agreement, Sustainable Development and the Public Interest*, IUCN, Environmental Policy and Law Paper No. 41, 12, at

<http://data.iucn.org/dbtw-wpd/edocs/EPLP-041.pdf> and *cf.* de Boer, Yvo, *Report on the Bangkok Climate Change Talks 2008* at European Patent Forum, Ljubljana, 7 May. 2008, 4, at http://unfccc.int/files/press/news_room/statements/application/txt/080507_speech_ljubljana.pdf

¹⁸ Gueye, Moustapha Kamal, *Technologies for Climate Change and Intellectual Property*, International Centre for Trade and Sustainable Development (ICTSD), Information Note No. 12 (October 2009).

¹⁹ Maskus, Keith E., Environmental Working Paper No. 17, *Differentiated Intellectual Property Regimes for Environmental and Climate Technologies*, Organisation for Economic Co-operation and Development (OECD) -5 May 2010, at No. 94

²⁰ Maskus (n. 19).

²¹ The UN Framework Convention on Climate Change (UNFCCC) encouraged developed countries to stabilize greenhouse gas emissions. UNFCCC entered into force on 21 March 1994 and has been ratified by 192 countries. The Kyoto Protocol, which has not been ratified by all parties to the UNFCCC, entered into force on 16 February 2005. Under this Protocol the industrialized countries *e.g.* commit themselves to a reduction of their collective greenhouse gas emissions by 5.2 percent from the 1990

level. For the period after 2012 new standards have to be agreed, where 20 percent probably will not suffice.

²² Maskus, Keith E., Environmental Working Paper No. 17, *Differentiated Intellectual Property Regimes for Environmental and Climate Technologies*, Organisation for Economic Co-operation and Development (OECD) -5 May 2010, at No. 94, *e.g.* referring to Clachan et al. (2010) and Copenhagen Economics (2009).

²³ IPCC (2000) *Methodological and Technological Issues in Technology Transfer* at 3.5.2.

²⁴ To the justifications for IPR also belong that they are: based on a utilitarian idea and a theory of ownership (Locke & Bentham); are part of 'Human rights' (Art. 17 of the EU Charter); a balance of rights and freedoms; and only monopolies that are useful to society are acceptable (Statute of Monopolies 1623); limited in time and inspire to fair competition in the market. They serve to promote societal progress... (U.S. Constitution), and, at least, originally they were fairly small exceptions.

²⁵ See *e.g.* Juma, Calestous, *Intellectual property rights and globalization: implications for developing countries*, at <http://www.cid.harvard.edu/archive/biotech/papers/discuss4.pdf>. The importance of an IP-based economy is underlined and supported by the fact that *e.g.* in the USA alone studies in the past decade have estimated that over 50 percent of US exports now depend on some form of IP protection, compared to less than 10 percent 50 years ago.

²⁶ Drexler, Joseph, *Responding to the Challenges for Development with a Competition-Oriented Approach in Views on the Future of the Intellectual Property System*, ICTSD Programme on IPRs and Sustainable Development, Selected Issue Briefs No. 1 (June 2007), 18, at www.iprsonline.org/ictsd/docs/Views%20Future%20IP%20System.pdf

²⁷ Maskus (n. 22).

²⁸ *Cf.* Annette Kur and Marianne Levin (eds.), *Intellectual Property Rights in a Fair World Trade System*, Edward Elgar Publishing Ltd., forthcoming

²⁹ Bangkok, April 2008, and *cf.* Art. 10 of the Protocol and Arts. 4.1(c) and 4.3 of UNFCCC, while Art. 4.5 urges developed countries to take practical steps to promote, facilitate and finance transfer of and access to ESTs and know-how to developing countries.

³⁰ Possible negative effects in LDCs are due to weak infrastructures, governance and competition systems; see Gueye, Moustapha Kamal, *Technologies for Climate Change and Intellectual Property*, International Centre for Trade and Sustainable Development (ICTSD), Information Note No. 12 (October 2009).., 3.

³¹ Art. 8.2, which is further supported by Art. 40: 'Members agree that some licensing practices or conditions pertaining to intellectual property rights which restrain competition may have adverse effects on trade and may impede the transfer and dissemination of technology.'

³² Cf. Maskus, Keith E. & Lahouel, Mohamed, who argue for a further development of TRIPS, where competition enforcement should aim at disciplining clearly anticompetitive licensing practices rather than attempt to force technology transfer on concessional terms and to encourage imitation without compensation; see *Competition Policy and Intellectual Property Rights in Developing Countries: Interests in Unilateral Initiatives and a WTO Agreement*, The WTO/World Bank Conference on Developing Countries' in a Millennium Round WTO Secretariat, Centre William Rappard, Geneva, 20-21 September 1999, 40.

³³ The European Patent Office (EPO), Scenarios for the Future (2007), 74, at <http://www.epo.org/topics/patent-system/scenarios-for-the-future.html>

³⁴ Kohr, Martin, *Intellectual Property, Competition and Development*, Third World Network (June 2005), 16, at <http://webcache.googleusercontent.com/search?q=cache:fWrDit3RIy8J:www.twinside.org.sg/title2/par/mk002.doc+6.+policies+and+methods+to+propertise+competition+principles,+kohr&cd=1&hl=sv&ct=clnk&gl=se>

³⁵ <http://www.greenfacts.org/en/climate-change-ar4/figtableboxes/40.htm>

<http://webcache.googleusercontent.com/search?q=cache:fWrDit3RIy8J:www.twinside.org.sg/title2/par/mk002.doc+6.+policies+and+methods+to+propertise+competition+principles,+kohr&cd=1&hl=sv&ct=clnk&gl=se>

³⁶ de Boer, *op. cit.*, 5 *et seq.*; Stern Report Part IV, 10, *Copenhagen Economics, op. cit.* 34 *et seq.*

³⁷ Principle 20 of the UN Conference on the Human environment, Stockholm (1972), and *cf.* also

the preamble and Art. 10.2 of the Basel Convention on the Prevention of Transboundary Movements of Hazardous Wastes.

³⁸ Ch.34:10.

³⁹ Ch. 34:14 b).

⁴⁰ Ch. 34:18 b) at iii) and iv), respectively.

⁴¹ A/RES/S-19-2, para. 88.

⁴² Under the Montreal Protocol, developed countries originally agreed to eliminate production and use of CFCs by the year 2000, whilst developing countries are given a ten-year grace period to do the same. A fund was set up to help developing countries meet the costs of implementing their phase-out, and the protocol's Article 10 provides for technology transfer to developing countries; *cf.* Kohr, Martin, *Intellectual Property, Competition and Development* (2005), 15.

⁴³ UNFCCC (Dec. 2007), Annex I.C.

⁴⁴ No. 34.

⁴⁵ See spec. paras. 1 (d) and 1 (e).

⁴⁶ Fulfillment of the Bali Action Plan (March/April 2009), No. 40.

⁴⁷ *Cf. Gueye op. cit.*, 8.

⁴⁸ A patent landscaping study is presently being made by the EPO in conjunction with United Nations Environment Programme (UNEP) and the ICTSD aims to contribute to this understanding. Preliminary results show that, over the past few years, there has been a marked increase in patenting activity in clean energy technologies as compared to those using fossil fuel energy. In particular, recent years have seen a rapid growth in wind power, solar photovoltaic (but not thermal) and CO₂ capture and storage technologies. Notably, the number of patents in these areas increased appreciably after the Kyoto Agreement was signed. The patenting activity in all relevant technologies appears to be dominated by Japan, the US, Germany, Korea, the UK and France. A full report on the findings is not due until the first half of 2010 in the area of energy generation, see <http://www.epo.org/about-us/press/releases/archive/2009/20091125.html>

⁴⁹ Maskus (n. 22), who at No. 94 concludes that neither of these positions is well informed with respect to the economics of intellectual property.

⁵⁰ The idea of linking IP to trade policy goes far back in history. Also the Paris Convention for the Protection of Industrial Property Rights (1883) and Berne Convention for the Protection of Literary and Artistic Works (1886) aim at simplifying cross-border trade with IP. The Paris Convention is expressly related to trade; and even if the word 'trade' does not appear in the Berne Convention, this treaty followed in the footsteps of the Paris Convention with the similar legal construction so as to protect an original work published in, or authored by a national of a Member State of the Berne Union against being copied and commercially explored in another part of the Union. Therefore, TRIPS' new trade-related title was obviously more of a way of lifting IP negotiations from WIPO to WTO in an ambition to advance the rules and get away from the dead-lock in WIPO, where North-South conflicts blocked all further developments.

⁵¹ There may be good grounds to presume that developing countries wanted to be part of the open trade, but were at the time in 1994 less observant on the claims included in the TRIPS part of the WTO package, which members have to adhere to as a whole.

⁵² ICTSD, *Climate Change, Technology Transfer and Intellectual Property Rights* (June 2008), 7.

⁵³ de Vuyst, Bruno, Fairchild, Alea M. & Meyer, Gunther, *Exceptions to Intellectual Property Rights: Lessons from WTO-Trips Panels*, Vol. 10, No. 4 (December 2003), at

http://www.murdoch.edu.au/elaw/issues/v10n4/meyer104_text.html.

⁵⁴ Gueye, Moustapha Kamal, *Technologies for Climate Change and Intellectual Property*, International Centre for Trade and Sustainable Development (ICTSD), Information Note No. 12 (October 2009).

⁵⁵ Frederick M. Abbott, *Innovation and Technology Transfer to Address Climate Change: Lessons from the Global Debate on Intellectual Property and Public Health*, Issue Paper No. 24 (2009), ix.

⁵⁶ Directive 98/44/EC of the European Parliament and of the Council of 6 July 1998 on the legal protection of biotechnological inventions.

⁵⁷ Case T-356/93; cited from Resource Book on TRIPS, note 618 at 379 f.

⁵⁸ Para. 7.19.

⁵⁹ Roffe, Pedro & Spenneman, Christoph, *Resource Book on TRIPS and Development: An authoritative and practical guide to the TRIPS Agreement*, ICTSD 2005, 378, at <http://www.iprsonline.org/unctadictsd/ResourceBookIndex.htm>.

⁶⁰ Kohr, Martin, *Intellectual Property, Biodiversity and Sustainable Development*, Zed Books, Third World Network 2002, 98.

⁶¹ Communication from DG Trade on 12 September 2009, following-up the decision of the TRIPs Council of 19 February 2003.

⁶² Cf. further on this issue *the UN Conference on Trade and Development (UNCTAD) Policy Brief Number 2* (December 2008), Does TRIPS Art. 66.2 Encourage Technology Transfer to LDCs? An Analysis of Country Submissions to the TRIPS Council (1999-2007), at: http://www.unctad.org/en/docs/iprs_pb20092_en.pdf

⁶³ See para. 6. The [Council for TRIPS was instructed to find an expeditious solution to the problem faced by countries with insufficient pharmaceutical production capacity by making an effective use of the compulsory licensing provisions in TRIPS, and in 2002, the WHO publicly stated its commitment to support WTO Members and the TRIPS Council in whatever way they wished in this regard. \(WTO Council for TRIPS, 5-7 March 2002\).](#)

⁶⁴ de Boer, Yvo, *Report on the Bangkok Climate Change Talks 2008* at European Patent Forum, Ljubljana, 7 May 2008, 4, at http://unfccc.int/files/press/news_room/statements/application/txt/080507_speech_ljubljana.pdf, 5.

⁶⁵ See Gueye, Moustapha Kamal, *Technologies for Climate Change and Intellectual Property*, International Centre for Trade and Sustainable Development (ICTSD), Information Note No. 12 (October 2009) 7.

⁶⁶ Barton, John H., *Intellectual Property and Access to Clean Energy Technologies in Developing Countries, An Analysis of Solar Photovoltaic, Biofuel and Wind Technologies* (December 2007), ICTSD Programme on Trade and Environment, vii; and cf. Art. 8.1 TRIPS, at <http://ictsd.net/i/events/dialogues/11251/>

⁶⁷ Adam, Alexander, *Technology transfer to combat climate change: opportunities and obligations under trips and Kyoto*, [Journal of High Technology Law](#), (Jan, 2009), 6.

⁶⁸ Cf. Eco Patent Commons, where big business since the 1990s make environmentally-friendly patents available to the public, at www.wbcscd.org/

⁶⁹ One not unessential problem seems to be patenting by universities and university inventors with public funding and whether such inventions should not go back to the public with some other incentive for successful scientists than ownership.

⁷⁰ Cf. Littleton, Matthew, The TRIPS Agreement and Transfer of Climate-Change-Related Technologies to Developing Countries, *DESA Working Paper No. 71*, ST/ESA/2008/DWP/71, 21, at http://www.un.org/esa/desa/papers/2008/wp71_2008.pdf

⁷¹ Cf. Findings in note 47 above.

⁷² Open from 12 May 2010. To the system is annexed a [database](#) that enables a search for published applications and granted patents which have been accelerated under the Green Channel. However, there are no plans to publish a separate list of all environmentally-friendly patents.

⁷³ Cf. Littleton, *ibid.*

⁷⁴ Cf. Littleton *ibid.*

⁷⁵ Since early 2008, several leading global businesses, including IBM, Sony, and Nokia, in association with the World Business Council for Sustainable Development (WBCSD), have announced the Eco-Patent Commons with the goal 'to create a collection of patents that directly or indirectly protect the environment'.

⁷⁶ This is not least true for the USA, presently not a signee of the Tokyo protocol, but together with China largest emitter of CO₂ in the world.

⁷⁷ 151 Smarzynska Javorcik, Beata, The Composition of Foreign Direct Investment and Protection of Intellectual Property Rights: Evidence from Transition Economies in *Intellectual Property and Development. Lessons from Recent Economic Research* (Carsten Fink and Keith E. Maskus eds.), World Bank & Oxford University Press 2005, 151, at <http://siteresources.worldbank.org/INTRANETTRADE/Resources/Pubs/IPRs-book.pdf>.

⁷⁸ See Falvey, Rod, Greenaway, David & Foster, Neil, Intellectual Property Rights and Economic Growth. *Internationalisation of Economic Policy Research Paper No. 2004/12*, 18-19, at

SSRN: <http://ssrn.com/abstract=715982>; also *Review of Development Economics*, Volume 10, Number 4 (November 2006), 700.

⁷⁹ Maskus, Keith E., The Role of Intellectual Property Rights in Encouraging Foreign Direct Investment and Technology Transfer in *Intellectual Property and Development* (2005), *op. cit.*, 41 *et seq.*

⁸⁰ Maskus, *op. cit.* (2005), 70.

⁸¹ Verspagen, Bert, Intellectual Property Rights in the World Economy in *Economics, Law, and Intellectual Property* (Ove Granstrand ed.), Springer 2004, 505.

⁸² Marinova, Dora & Raven, Margareth, Indigenous Knowledge and Intellectual Property: A Sustainable Agenda, (2006) *Journal of Economic Surveys*, Vol. 20, No. 4, 597, at

<http://www3.interscience.wiley.com/cgi-bin/fulltext/118583570/PDFSTART>.

⁸³ Cf. Abbott *op. cit.*, vi.

Climate Change and Intellectual Property after COP 15: In Search of a Workable Framework for the Transfer of ESTs*

*Monirul Azam***

Climate change is viewed as one of the most serious threats to the global environment and to sustainable development. Government representatives, environmentalists, lawyers, industry groups, development lobbyists, human rights activists and carbon traders, all agree on one thing: Innovation and new technologies will play a crucial role in meeting the challenge of global climate change. But the lack of investment capacity for R&D on ESTs in developing countries on the one hand, and on the other all those recourses available in developed countries with strong private entities has brought forth a debate of intellectual property rights (IPR) and climate change. This calls for striking a balance between the interest of IPR owners in developed countries and potential users in developing countries to facilitate technology transfer for the mitigation and adaptation to climate change. This paper will try to evaluate technology transfer issues from the context of international environmental law and intellectual property law and suggest some possible means for a successful climate negotiation and transfer of ESTs.

1. Background

Climate change is viewed as one of the most serious threats to the global environment and to sustainable development. Adverse impacts on human health, food security, infrastructure, economic activity, biological diversity and natural resources are expected.¹ Most of the world's scientists agree that rising concentrations of greenhouse gases in the Earth's atmosphere emitted by human activities are leading to changes in the climate. The most recent Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) completed in November 2007² finds with more than 90 percent certainty that human actions since the Industrial

Revolution have contributed to the warming climate.³

The response to climate change problems is fundamentally linked to pressing concerns of sustainable development and global fairness; of economy, poverty reduction and society; and of the world we want to hand down to our future generations.⁴ Government representatives, environmentalists, lawyers, industry groups, development lobbyists, human rights activists and carbon traders all agree on one thing: Innovation and new technologies will play a crucial role in meeting the challenge of global climate change.⁵ But most of the developing and least developed countries (LDCs) do not have resources for research and development (R&D) or access to these advanced technologies (hereinafter used as Environmentally Sound Technologies: ESTs) necessary for mitigation and adaptation to climate change.

The lack of investment capacity for R&D on ESTs in developing countries on the one hand, and on the other all those recourses available in developed countries with strong private entities has brought forth a debate of intellectual property rights (IPR) and climate change. IPR refer to the protection of rights for the owners of ideas and innovation, research and development, manufacturing processes and technology, as well as the required payment of royalties for the use of patented items, and investors and companies in developed countries are not interested in transferring their technologies to the developing

countries due to lack of proper IPR protection. This calls for striking a balance between the interest of IPR owners in developed countries and potential users in developing countries to facilitate technology transfer for the mitigation and adaptation to climate change.

Before embarking into the details of debate regarding IPR and technology transfer, it may not be out of place to mention some key organisations and terms, such as the World Intellectual Property Organisation (WIPO), the World Trade Organisation (WTO), Trade Related aspects of Intellectual Property Rights (TRIPS), Multilateral Environmental Agreement (MEA), the United Nations Framework Convention on Climate Change (UNFCCC) and the Conference of Parties (COP). The international intellectual property system as we know it today can be traced back to the Paris Convention of 1883 and the Berne Convention of 1886. The adoption of both the Paris and Berne Conventions was accompanied by the establishment of secretariats in the form of international bureaux. The two bureaux were merged in 1893 to create the *Bureaux Internationaux reunis pour la protection de la propriete intellectuelle* (BIRPI) in Berne, the immediate predecessor of WIPO.

The idea of transforming BIRPI into an international intellectual property organization initially arose at the 1962 meeting of the Permanent Bureau of the Paris Union and the Berne Union.⁶ At that meeting, the Permanent Bureau recommended the setting up of a Committee of Governmental Experts to consider administrative and structural reforms to the Paris and Berne Union systems and prepare for a diplomatic conference. Finally, WIPO came into being, with its headquarters in Geneva, in 1970 when the Stockholm Convention came into force, and subsequently became a specialized agency of the United Nations (UN) in 1974. In addition to

the Paris and Berne convention(s), WIPO now administers 23 agreements relating to IPR.⁷

Therefore, WIPO maintains comprehensive lists of intellectual property agreements for copyright, patent, trademarks, design and other related IPR fields. Despite having comprehensive coverage, enforcement mechanisms for the IPR under the WIPO agreements are voluntary in nature, hence not that much effective, which triggered the situation for the adoption of the TRIPS Agreement under the WTO.

The adoption and entry into force of the WTO's TRIPS Agreement substantially changed the international intellectual property regime by introducing the principle of minimum standards and mandatory enforcement mechanisms.⁸ It is also noting that the principle constitutes a significant conceptual and strategic basis for subsequent multilateral and bilateral intellectual property negotiations aimed at setting higher and more expansive standards. Its effect is that any intellectual property agreement negotiated subsequently to TRIPS among and/or involving WTO members can only create higher standards. These higher standards and compulsory enforcement mechanisms have consequently been debated by the developing countries as a barrier to technology transfer at the forum of different MEAs.

An MEA is a legally binding agreement between two or more countries containing specific environment-related objectives and commitments. MEAs, in some form, have been in place for about a hundred years.⁹ Countries that ratify after adoption and signature or accede to a particular international agreement are called Parties. They meet periodically through COP to assess different aspects and implementation of MEAs.¹⁰ Most of the MEAs have been developed in the last three decades, especially since the 1972

International Stockholm Conference on Human Environment. Some studies conservatively estimate that approximately 700 MEAs are currently in place.¹¹ Among them, UNFCCC and its Kyoto Protocol specifically deal with the issues of climate change.

In 1992, UNFCCC was adopted as the basis for a global response to the problem of climate change. With 194 Parties (193 States and one regional economic integration organization –the EU), the Convention enjoys near-universal membership.¹² The ultimate objective of the Convention is to stabilise greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system. The Convention is complemented by the 1997 Kyoto Protocol, which has 191 Parties (190 States and one regional economic integration organization – the EU).¹³

Under the Kyoto Protocol, 37 industrialised countries and the European Union have committed to reducing their emissions by an average of 5 percent by 2012 against 1990 levels.¹⁴ Although industrialized countries must first and foremost take domestic action against climate change, the Protocol also allows them to meet their emission reduction commitments abroad through so-called “market-based mechanisms”.

For example, one of the Protocol’s market-based mechanisms, the clean development mechanism (CDM),¹⁵ permits industrialized countries to earn emission credits through investment in sustainable development projects that reduce emissions in developing countries. The UNFCCC and its Kyoto Protocol are also designed to assist countries in adapting to the inevitable effects of climate change. They facilitate the development of techniques that can help increase resilience to climate change impacts – for example, the development of salt-resistant crops – and to

exchange best practices with regard to adaptation.

Despite these initiatives under the UNFCCC and the Kyoto Protocol, technology transfer for the adaptation and mitigation of climate change remains a debatable topic considering the patent protection of the relevant technologies, associated high costs of royalties and low level of technological development in the developing and least developed countries.

One remedy proposed by some public interest groups and developing countries is to change the international laws on patents so that the full weight of IPR is not applied to ESTs.¹⁶ But an inclusion of patent waiver provisions in the Multilateral Environmental Agreements (MEAs) is not enough to ensure transfer of ESTs. While IPR are internationally regulated by agreements under the WIPO and WTO, respectively, IPR are not expressly mentioned in the leading MEAs dealing with climate change issues, especially in the UNFCCC and the Kyoto Protocol. It is, however, argued that an ‘enabling environment’ for transfer of technology – the establishment of the institutions, regulations and policies – is needed to promote technology transfer. But what would be the role of IPR in making ‘enabling environment’ is not clarified or mentioned. Nor is it, despite the existence of technology transfer provisions in the agreement between WIPO and the UN recognising WIPO as a special UN agency¹⁷ and in the WTO TRIPS agreement, clarified how far IPR can be exploited in the context of climate change.

During the 15th Conference of Parties (COP 15) of the UNFCCC in Copenhagen December 7-18, 2009, high level negotiators from 192 nations tried to address the significant changes urgently needed to mitigate the effects of global warming and climate change, including transfer of ESTs.

This short paper will try to evaluate technology transfer issues from the context of international environmental law and the IPR regime and suggest some possible means for a successful negotiation and transfer of ESTs.

2. Technology transfer and ESTs

The term 'Technology Transfer' has been defined in IPPC's Special Report on Methodological and Technological Issues on Technology Transfer (2000) as "a broad set of processes covering the flows of know-how, experience and equipment for mitigating and adapting to climate change amongst different stakeholders". Chapter 34 of Agenda 21 (The Rio Declaration on Environment and Development, 1992)¹⁸ defines ESTs as technologies, which:

protect the environment; are less polluting;

use all resources in a more sustainable manner;

recycle more of their wastes and products; and

handle residual wastes in a more acceptable manner than the technologies for which they are substitutes.

ESTs are therefore technologies with the potential for significantly improved environmental performance relative to other technologies.

Agenda 21 also contains several other important statements to guide the interpretation of this definition with emphasis on facilitating access to and transfer of technology, particularly in developing countries, as well as the essential role of capacity building and technology cooperation in promoting sustainable development. Thus, successful technology transfer means that it is necessary to take a broad view of 'Technology' meaning not only machines and equipment but also the skills, abilities, knowledge, systems and processes necessary to make things happen, i.e. the total system of know-how, procedures, goods and services, as well as organizational and

operational measures, and it should include both adaptation and mitigation technologies.

Below the commitments made under the MEAs and the IPR agreements for the technology transfer are examined to see how far these are effective to facilitate transfer of ESTs in the context of such a broad view.

3. Commitments under UNFCCC and IPR Agreements

Under MEAs like UNFCCC states are under an obligation of technology transfer. The technology transfer regime in UNFCCC is established by Articles 4.5 and 4.7. Article 4.5 provides:

"The [developed countries] shall take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies and know-how to [developing countries] ..."

During COP-7 (2001) in Marrakech, Morocco, in the final accord the parties agreed to the adoption of a framework for meaningful and effective actions to enhance the implementation of Art. 4.5 of the UNFCCC¹⁹. Five key activities were mentioned: Technology need assessments, technology information, enabling environments, capacity building and mechanisms for technology transfer.

Article 10.6 (c) of the Kyoto Protocol commits Parties to

"cooperate ... for the development, application and diffusion of, and take all practicable steps to promote, facilitate and finance practices and processes pertinent to climate change... including the formulation of policies and programmes for the effective transfer of environmentally sound technologies that are publicly owned or in the public domain and the creation of enabling environment for the private sector, to promote and enhance the transfer of access to, environmentally sound technologies".

The Rio Declaration on Environment and Development, one of the many outputs of the UN

Conference on Environment and Development (1992), specifically mentions in Chapter 34 that:

“States should cooperate ... by enhancing the development, adaptation, diffusion and transfer of technologies, including new and innovative technologies”.

To sum up, in the above provisions is reflected that required finance and cooperation for an ‘enabling environment’ between the developed and developing countries and with private entities is necessary for the successful transfer of ESTs. But till date there is no coherent framework, and the lack of enabling actions for the successful EST transfer as mentioned in the above MEAs is due to following fundamental problems:

First, non-binding character and vagueness of obligations and ineffective compliance mechanisms: In the above mentioned provisions of the UNFCCC and the Kyoto Protocol and the final accord wordings like ‘all parties’ shall ‘promote’, ‘facilitate’ ‘cooperate’ or ‘agree’ on the EST transfer or some practicable steps, open for too many discretions and loopholes and hence are not effective for the meaningful transfer of ESTs.²⁰

Second, the lack of proper definitions of ESTs: In most of the MEAs due to an insufficient, or non-existent, definition of what constitutes ESTs and debate as to process of ESTs transfer precisely may create problems for the successful transfer of ESTs.²¹

Third, none of the MEAs mention anything about the possible conflict between transfer of ESTs and IPR: The language of the Kyoto Protocol, emphasizing the role of the private sector (as well as public sector and public domain technologies), is devoid of specific commitments, whereas the Rio declaration mentioned new and innovative technologies but lacks an effective compliance mechanism. Thus, it is not clarified what would

be the possible solution if there is a conflict between the commitments of technology transfer and other international agreements such as the patent law provisions of the TRIPS.

All these fundamental problems call for the development of a coherent EST transfer regime that can be used in MEAs as well as in trade and technology agreements. But before searching for balanced solutions between MEAs and IPR agreements, also some of the often cited commitments for the technology transfer under the IPR agreements will be mentioned here to show the obligation of the developed countries to facilitate technology transfer to the developing countries.

Article 1 of the Agreement between the WIPO and the UN states:

“The United Nations recognizes the World Intellectual Property Organization... as a specialized agency and as being responsible for taking appropriate action in accordance with its basic instrument, treaties and agreements administered by it, inter *alia*, for promoting creative intellectual activity and for facilitating the transfer of technology related to industrial property to the developing countries in order to accelerate economic, social and cultural development, subject to the competence and responsibilities of the United Nations and its organs...”

Article 10 of the Agreement explicitly mentioned technology transfer:

“The Organization agrees to co-operate in promoting and facilitating the transfer of technology to developing countries in such a manner as to assist these countries in attaining their objectives in the fields of science and technology and trade and development”.

However, before embarking into resultant action based on above provisions also the similar provisions in WTO/TRIPS should be mentioned. In Article 7 TRIPS the objectives of the Agreement are stated:

“The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations”.

Article 8.2 TRIPS mentions that WTO Members may take:

“appropriate measures, provided that they are consistent with the provisions of this Agreement, ... needed to prevent the abuse of intellectual property rights by right holders or the resort to practices which unreasonably restrain trade or adversely affect the international transfer of technology”.

Furthermore, Article 66.2 TRIPS provides that:

“Developed country Members shall provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to least-developed country Members in order to enable them to create a sound and viable technological base”.

Therefore, a close scrutiny of the above provisions of the UN/WIPO and WTO/TRIPS reflect that, in spite of the fact that the primary objectives of the WIPO and WTO Agreements are to ensure effective protection and enforcement of IPR, these Agreements also include commitments to facilitate the transfer of technology to create a “sound and viable technological base” (as mentioned in TRIPS) and “to accelerate economic, social and cultural development in the developing countries” (as mentioned in the UN/WIPO Agreement). But in reality there is a considerable gap between the intentions expressed on the agreed technology transfer provisions and the resulting actions.²² Even if there exist some flexibility in defining inventions, exception to patent rights and the freedom to determine national patent laws while implementing TRIPS and other IPR agreements, the overall framework favours IPR holders.²³

E.g., in the context of technology transfer Article 8.2 of TRIPS is important, since the necessity to prevent the resort to practices that adversely affect the international transfer of technology is acknowledged. But at the same time it is stipulated that the measures should be consistent with the provisions of the (TRIPS) Agreement. Article 40.2 TRIPS state that only if such practices constitute an “abuse” of IPR and have an “adverse effect on competition in the relevant market” Members are free to adopt appropriate measures. Thus, are possible actions under Article 8.2 circumscribed by Article 40?²⁴ In fact, the capacities of states to take steps that prohibit anti-competitive practices in technology transfer seem to be severely limited. This raises questions about the scope of competition policy in fostering technology transfer and in prohibiting anti-competitive practices.²⁵

Again, it is argued by the LDC’s that the commitment of technology transfer under the Art. 66.2 of TRIPS is not implemented and/or no meaningful actions have been taken to fulfil the provision till date²⁶. In fact, Article 66.2 of TRIPS does not specify what type of incentives must be created, or how effective these incentives must be; developed countries have essentially been left to implement the provision, or not, as they consider fit. However, during the February 18-20, 2003 meeting of the Council for TRIPS (TRIPS Council), a ‘Decision on Implementation of Article 66.2 of the TRIPS Agreement’ was adopted that requires developed-country members to submit yearly reports detailing the incentives they have created for technology transfer to LDCs.²⁷ These reports are then discussed annually at meetings of the TRIPS Council, but there is no agreed standard by which to evaluate them, and again some LDCs and commentators have expressed dissatisfaction with the level of assistance given by the developed countries in this regard.²⁸

Therefore, unless it is clarified how these provisions should be implemented and what resultant actions are to be taken in the context of climate change, the role of IPR for the transfer of ESTs cannot be precisely defined. Nevertheless, how IPR rules are debated from the environmental perspectives, especially during climate change negotiation, may give some guideline for a future solution.

4. The debate over climate change and IPR rules

During climate change negotiations it is reflected that developing countries are more vulnerable to the negative impacts of climate change given their greater dependence on the natural environment and demographic size. At the same time they lack access to appropriate ESTs as well to mitigate and adaptation to climate change.²⁹ This is why technology transfer has long been a theme at environmental summits, dating back to the 1972 Stockholm Convention followed by the Rio Declaration 1992, and in all COP of the UNFCCC, but without any meaningful solution to address IPR issues related to transfer of ESTs. This has consequently also been mirrored in the meetings of WIPO and WTO in the aftermath of the Rio Declaration where more and more divergence has been spurred. Although in the wake of the Copenhagen Meeting the link between transfer of ESTs and IPR provisions was debated from climate change perspectives, the final settlement, the so-called Copenhagen Accord, did not address this issue.³⁰

Debates at the Conference of Parties under the UNFCCC Conference (in the Ad-hoc Working Group on Long-term Cooperative Action) over the appropriate role of IPR in climate change technologies illustrate the stunning split between those in favour of a strong IPR regime and those against this³¹. For example, industrialized countries such as the United States of America

(USA) and Australia seek improvement of IPR protection and enforcement, whereas developing countries such as Brazil, India and China seek mechanisms that avoid 'over-protectionism' of patents.³² Most of the LDCs also support the position of Brazil, India and China.

But TRIPS include transitional provisions in Art. 66.1, which allows the 32 LDCs to be exempted from TRIPS regulations until 2013 (and until 2016 for pharmaceutical products). Even without having any patent protection for the ESTs in the LDC's, they still lack access to ESTs; therefore, making compulsory licensing for ESTs while making TRIPS compliant regime in these countries from July 2013 may not change the situation, as most of them lack adequate technical capacity and skill to exploit ESTs. A report commissioned by the European Commission (DG Trade, 2009) on the technology transfer issues determined that:

"dismantling or weakening the intellectual property rights system would not only hinder the access of developing countries to costly technology, it would also hinder the access to low cost technology as IPR protected technology is also to be found among the low abatement cost technologies".³³

Scholars like professor *Keith Maskus* believe that IPR is not the most important issue surrounding technology transfer. Instead, for effective technology transfer infrastructure, absorption capacity (including human capital) and governance must be in place³⁴. Furthermore, in a UNFCCC survey of developing and poorer nations the lack of financial resources is identified as the main economic and market barrier to technology transfer, while few nations consider IPR as a significant impediment, ranking IPR behind nine other barriers in terms of importance.³⁵ The main barriers include: high investment costs, incompatible prices, subsidies and tariffs, lack of incentives, consumers' low

income, high upfront costs, and lack of access to credit.³⁶In this context, the Secretary General of the UN Conference on Trade and Development, *Supachai Panitchpakdi*, said that “intellectual property is a critical issue in technology transfer”.³⁷ He quoted a Chatham House report that concludes that “the IP system is too cumbersome. Instead the rules must strike a balance between IP holders and the public interest, and the Copenhagen meeting should right that balance”.³⁸

Although the Copenhagen Accord failed to make that balance, it would not be out of place to examine the provisions of the accord, which may have some relevance to the issue of technology transfer.

5. COP 15 and technology transfer: n search of a workable framework

5.A. COP15 Accord and technology transfer

In the COP 15 Final Accord, although developed countries made certain announcements in relation to emission reduction targets and financial pledges, no similar intention was reflected in the area of technology transfer and co-operation. Sweden, on behalf of the European Union (EU), mentioned in general terms that “a system should be established to provide long-term support to developing countries for reducing emissions, adaptation, technology co-operation and transfer.” Developing countries, on the other hand, called on developed countries to honour their commitments and speed up the transfer of ESTs.

The Copenhagen Accord intends to establish a ‘Technology Mechanism’ to accelerate technology development and transfer in support of actions on adaptation and mitigation. It further specifies that the mechanism will “be guided by a country-driven approach and be based on national circumstances and priorities” (para. 11). And

technology is mentioned in other parts of the Accord, such as para. 3, which states 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.”

But in reality, all these jargonized, beautifying words are useless for solving the tension between climate change and transfer of ESTs and related IPR issues.

At stake are not only issues of global concern that are too complex to be narrowed down to one-type issues such as ‘banning patents’ or ‘a complete waive of IPR to ESTs’, as argued by some developing countries. Developing countries are not to blame for climate change and should therefore be ‘reimbursed’ by the rich polluting nations.³⁹ Developing countries will not bear any responsibility, leaving obligations only to the developed world. To support such a position, one strong argument, reiterated and at times simplified by the media, is that countries in the developed world have caused most of the world’s climate issues since their industrialization from the 1850s, and they should therefore pay for it.⁴⁰

We should, however, not forget that, “an eye for an eye will make the whole world blind”.⁴¹ The way forward is rather shared responsibilities than someone to blame. In the Singapore Declaration on Climate Change, Energy and Environment ‘Common but Differentiated Responsibility’ is invoked and is reaffirmed by stressing that:

“all countries should play a role in addressing the common challenge of climate change, based on the principles of common but differentiated responsibilities and respective capabilities; and that developed countries should continue to play a leading role in this regard”.⁴²

5.B. Towards successful climate Negotiations and a workable framework for the transfer of ESTs

The debate over the transfer of ESTs mostly goes on in the context of climate change negotiations under the UNFCCC. But related IPR issues are mostly subject matter of WTO TRIPS agreement. As TRIPS do not specify the treatment of climate change or ESTs, developing nations have sought support in the Doha Ministerial Declaration on a public health exemption under TRIPS. In this way, poorer nations would gain access to ESTs through compulsory licensing⁴³ by arguing that climate change represents a national health emergency. There are, however, serious flaws in this argument.

The patent issues for ESTs are not the same as pharmaceuticals, as ESTs require many different technological inputs. Japan and the EU argue e.g. that while there is generally only one patent per pharmaceutical product, climate change mitigation technologies almost always require numerous patents held by many different firms⁴⁴. In fact, neither waivers nor banning or compulsory licensing of ESTs may contribute to the reduction of climate change. It might be useful for some technologically developed developing countries like China, India, South Korea, Brazil and South Africa with technical capacity to imitate, but the LDCs, despite having the IPR exemption until 2013, cannot make use of a possible free access to ESTs under a compulsory licensing regime due to lack of technical capacity and know-how. Therefore, for the LDCs and vulnerable states compulsory licensing provisions cannot be the solution. Furthermore, research based institutions and multinational organizations may not be interested in working on the technologies required nor willing to transfer their technology to countries with weak IP laws.

In conclusion, the debate over IPR issues involving stubborn position on compulsory licensing or banning of patents to ESTs in the UNFCCC may rather risk preventing the involved parties from reaching viable solutions for climate change and increasing tensions between the environmental regime under the UNFCCC and the trade-related IPR regime under WTO/TRIPS. Their objectives are different. It is also worth mentioning that the UNFCCC has no mandate to make a patent waiver for ESTs. This does not contradict the crucial needs to accelerate use of ESTs around the world, which could be a way of reconciling the works of both organizations. However, wishful declarations on transfer of ESTs will not be meaningful, and no deal is better than a bad deal in this context. That is why successful negotiation over green house gas reduction, funding and more efforts for country and region specific technology development, and not least the creation of a culture of 'Technology Exchange' without going beyond the existing IPR regime, may give better future result than campaigning and debating over technology transfer and waivers.

5.B.I) Technology exchange between the GE-10 and the vulnerable-5 during the UNFCCC summit:

Rather than trying to make an agreement between over hundred countries, effective solutions may be easier to reach among representatives of bigger interest groupings based on their global emissions (GE) and vulnerability (V) due to climate change problems. Therefore, there may be a system of negotiating parties divided into two groups:

- The GE-10 consisting of the USA, the EU, Australia, Brazil, Canada, China, India, Japan, Russia and South Africa, which accounts for more than three-quarters of the total GE, and

- The Vulnerable 5 consisting of: one representative from other developing countries⁴⁵, one from the African Group as IPCC Fourth Assessment Report February 2007⁴⁶ termed Africa as one of the most vulnerable continents to climate change,⁴⁷ one from the Small Island States,⁴⁸ one from the most vulnerable LDC's,⁴⁹ and the fifth one will be IPCC and UNEP as jointly representing 'the global public interest Ombudsperson' (who will take submissions from other national, regional and international public interest groups on the related issues).⁵⁰

5.B.II) Financing and capacity building: towards culture of technology exchange

In Copenhagen, developed countries committed to providing U\$30 billion for mitigation and adaptation for the period 2010 to 2012, most of which will flow through a Copenhagen Green Climate Fund established as an operating entity of the financial mechanism of the UNFCCC, i.e. the UN Global Environment Facility. But simply money to vulnerable states may not work. In my view, it would be better to make a long-term plan for the utilization of the fund and to have more commitment for the utilization of ESTs, their development and technology transfer. This new 'Technology Exchange' may work in the following way:

- *Establishment of Technology Assessment Reports:* All the LDCs, which are the most vulnerable states, and the African group will be encouraged to make country specific studies on technology assessments for climate change mitigation and adaptation technologies and related IP issues, to be reviewed by the UNEP and IPCC from an environmental perspective and by WIPO from IP

perspective, or a coordination body may be established. It will clearly mention technologies in the public domain, existing patented technologies and future technologies.

- *Funding for technology development and transfer: Related IPR issues:* On the basis of technology assessments, local and/or regional research centers will be given 'result and goal oriented' funding, provided that they use the funding for the research and development of technologies necessary for the climate change mitigation and adaptation in the particular country and region. They will be encouraged to exchange their research and findings with other similar research centres. Where applicable, UNEP and IPCC will negotiate on behalf of a particular country for the transfer of patented ESTs, (if necessary) for climate change mitigation and adaptation in the respective countries.
- *Research on country and region specific ESTs* should establish future potential technologies, public and private partnership.
- *For sharing technology,* the Canadian approach⁵¹ to the determination of royalties may be adopted as a prototype, based on the ranking of concerned importing countries in the Human Development Index (HDI) of the UNDP. The Canadian royalty guidelines result in relatively low royalties.⁵²

In addition, the above approach of capacity building on ESTs in the developing countries and LDCs within the culture of 'Technology Exchange' may also be integrated as an interpretation of Art. 66.2 of TRIPS to implement

obligations and commitments of the developed countries for technology transfer to the LDCs.

6. Concluding remarks

If the above mechanism is successfully implemented, developing countries will emerge as technology owners at a certain point of time rather than simply being technology users, and it will create a viable culture of 'Technology Exchange' between the North-South and the South-South rather than a simple one way technology transfer. On the other hand, separate arrangements under the WTO regime to support actions taken under the UNFCCC may not be necessary, if the WTO would make an explanatory clause to Art. 66.2 to better enforce the obligation to transfer ESTs to the LDCs. In this way, the UNFCCC could make a solution for the transfer of ESTs which is development-friendly and IPR-consistent and at the same time workable for enhancing the use of ESTs for the mitigation and adaptation to climate change rather than earlier vague provisions without having any resultant actions.

* This article is a revised version of the author's presentations at the Nordic IP Network Meeting on April 15-17, 2010. Helsinki, Finland and the conference on Regulating Global Concerns: Climate Change and Intellectual Property Rights, arranged by Aarhus School of Business, Aarhus University, May 10-12, 2010, at the Sandbjerg Estate, Sonderborg, Denmark. The author would like to thank Professor Marianne Levin, LL.D, PhD h.c, for her comments on the first draft of this article and anonymous reviewers for useful comments.

** Researcher on Intellectual Property and Climate Change, Department of Law, Stockholm University. <monirul.azam@juridicum.su.se>

¹ Azam, Mohammad Monirul, IP Day 2009: Green innovation and technology transfer, The Daily Star, Dhaka, April 15, 2009, available at <http://www.thedailystar.net/law/2009/04/04/index.htm>.

² The United Nations Intergovernmental Panel on Climate Change (IPCC) was established by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) to assess scientific, technical and socio-economic information concerning climate change and its potential effects and options for adaptation and mitigation. The IPCC reports are intended to assess scientific, technical and socio-economic information concerning climate change, its potential effects, and options for adaptation and mitigation. The 2007 Report is the so far largest and most detailed summary of the climate change situation ever undertaken, involving thousands of authors from dozens of countries, and states in its summary that "warming of the climate system is unequivocal and most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations." IPCC's First Assessment Report was completed in 1990 and served as the basis of the United Nations Framework Convention on Climate Change (UNFCCC). The Second Assessment Report was published in 1995 followed by the Third Assessment Report in 2001. The Fifth Assessment Report is due in 2014.

³ Some of the predicted impacts of climate change listed in the IPCC report include: Water availability will increase to 10 to 40 per cent at high latitudes and in some wet tropical areas; Water availability will decrease by 10 to 30 per cent in some dry regions at mid latitudes and in the dry tropics; Globally food production is predicted to increase with warming of 1 to 30°C, but above this it will decrease. Notably, health effects including increased frequency of cardio-respiratory diseases due to higher concentrations of ground level ozone, increased diarrhea disease, increases in malnutrition and consequent disorders, and increased deaths, disease and injury due to heat waves, floods, storms, fires and droughts.

⁴ UN Secretary General Ban Ki-moon, UN Climate Change Conference in Bali, Indonesia, December, 2007.

⁵ Azam, Mohammad Monirul, Capacity Building on Climate Change Technology in the Least Developed Countries: The Context of Bangladesh, Second International Environmental Conference, January 2-3, 2009, Dhaka, Bangladesh.

⁶ Sisule F Musungu and Graham Dutfield, Multilateral agreements and a TRIPS-plus world:

The World Intellectual Property Organisation (WIPO), Quaker United Nations Office (QUNO), Geneva, 2003.

⁷ For details on the WIPO administered agreements/treaties see: <http://www.wipo.int/treaties/en/>, accessed on July 24, 2010.

⁸ Munsungu (n. 6).

⁹ See for details, *Multilateral Environmental Agreements: A Handbook for Afghan Officials*, United Nations Environment Programme, Post-Conflict and Disaster Management Branch, 2008.

¹⁰ Unless otherwise mentioned, this article refers to COP as arranged under the UNFCCC only.

¹¹ Their proliferation is mainly due to an appreciation of the gravity of environmental problems facing our planet today (largely as a result of human activity), plus a growing understanding that environmental issues are often not only local in nature, but also regional and global. Therefore, the solutions and tools to deal with them should also be regional and global in their scope. See for details *Multilateral Environmental Agreements: A Handbook for Afghan Officials*, United Nations Environment Programme, Post-Conflict and Disaster Management Branch, 2008.

¹² Status of ratification of the UNFCCC, available at http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php, accessed on July 18, 2010.

¹³ See note 12.

¹⁴ See for details http://unfccc.int/kyoto_protocol/items/2830.php, accessed on July 16, 2010.

¹⁵ The Clean Development Mechanism (CDM), defined in Article 12 of the Protocol, allows a country with an emission-reduction or emission-limitation commitment under the Kyoto Protocol (Annex B Party) to implement an emission-reduction project in developing countries. Such projects can earn saleable certified emission reduction (CER) credits, each equivalent to one tonne of CO₂, which can be counted towards meeting Kyoto targets. For latest information on CDM see: <http://cdm.unfccc.int/index.html>, accessed July 19, 2010.

¹⁶ Developing countries like India and China along with public interest groups and independent non-profit international network of organisations like Third World Network claim this kind of waiver.

¹⁷ Agreement between the United Nations and the World Intellectual Property Organization WIPO 1974 (came into effect from December 17, 1974).

¹⁸ Agenda 21 is a programme run by the United Nations (UN) related to sustainable development, and it was the first summit ever to discuss global warming related issues. It is a comprehensive blueprint of action to be taken globally, nationally and locally by organizations of the UN, governments, and major groups in every area in which humans directly affect the environment. The full text of Agenda 21 was revealed at the United Nations Conference on Environment and Development (Earth Summit), held in Rio de Janeiro, Brazil 3-14 June, 1992, where 178 governments voted to adopt the program. The final text was the result of drafting, consultation and negotiation, beginning in 1989 and culminating at the two-week conference. The number 21 refers to an agenda for the 21st century. See for details, <http://www.un.org/esa/dsd/agenda21/>, accessed on July 20, 2010.

¹⁹ See The Marrakesh Accords for the framework of meaningful and effective actions to enhance the implementation of Article 4.5 of the Convention, available at http://unfccc.int/cop7/documents/accords_draft.pdf (accessed on May 4, 2010).

²⁰ Klaus Bosselmann, 'Poverty Alleviation and Environmental Sustainability through Improved Regimes of Technology Transfer', *2/1 Law, Environment and Development Journal* (2006), p. 19.

²¹ IPCC, *Methodological and Technological Issues in Technology Transfer* 3, pp. 57-60 and 62-63. (Cambridge: UNEP and WMO, 2000).

²² UNCTAD, *International Arrangements for Transfer of Technology: Best Practices for Access to and Measures to Encourage Transfer of Technology with a View to Capacity Building in Developing Countries*, especially in Least Developed countries, UN Doc. TD/B/COM.2/EM.9/2(2001) at 5-6, 14-15. 20.

²³ Srinivas, K. Ravi, *Climate Change, Technology Transfer and Intellectual Property Rights*, RIS-DP # 153, India, April 2009.

²⁴ Srinivas (n. 23).

²⁵ Srinivas (n. 23).

²⁶ Salma Chaudhuri Zohir and Narayan Chandra Nath, *Development Dimension of the Doha Agenda-A Major Concern*

for *South Asia*, p. 316, available at <http://www.cuts-international.org/SAFIT/chp6-Development.pdf>, accessed on May 16, 2010.

²⁷ See IP/C/28 and further Between Trade and Sustainable Development, *Bridges* Vol. 7, No. 2, March 2003, available at <http://www.ppl.nl/ebooks/files/BRIDGES7-2.pdf> (accessed on May 15, 2010).

²⁸ Suerie Moon, Does TRIPS Art. 66.2 Encourage Technology Transfer to LDCs? An analysis of Country Submissions to the TRIPS Council (1999-2007), *UNCTAD-ICTSD Project on IPRs and Sustainable Development, Policy Brief No. 2* (Dec. 2008)

²⁹ Technologies are necessary both for mitigation and adaptation to climate change in the developing countries. Such as mitigation technology to reduce GHG emissions to avoid the possible impacts of climate change and new varieties of rice to adapt with climate change.

³⁰ See for details, Copenhagen Final Accord, available at http://unfccc.int/files/meetings/cop_15/application/pdf/cop15_cph_auv.pdf (accessed on December 29, 2009).

³¹ UNFCCC, 2009, Conference of Parties, Ad-hoc Working Group on Long-term Cooperative Action Under the Convention, Poznan, 1-10 December, 2008, *Ideas and Proposals on Paragraph 1 of the Bali Action Plan*, Para. 129. U.N. Doc FCCC/AWGLCA/2008/16/Rev.1, United Nations, New York.

³² See note 31.

³³ Copenhagen Economics A/S and The IPR Company ApS, "Are IPR a Barrier to the Transfer of Climate Change Technology?" Copenhagen (19 January 2009), p. 39.

³⁴ Keith E. Maskus, Kamal Saggi, and Thitima Puttitanun, "Patent Rights and International Technology Transfer through Direct Investment and Licensing," in *International Public Goods and Transfer and Technology Under a Globalized Intellectual Property Regime*, (Eds. Keith E. Maskus and Jerome H. Reichman), Cambridge: Cambridge University Press, 2005, p. 266.

³⁵ UNFCCC 2006, Subsidiary Body for Scientific and Technological Advice, *Synthesis Report on Technology Needs Identified by Parties not Included in Annex I to the Convention*. U.N. Doc. FCCC/SBSTA/2006/INF.1. United Nations, New York.

³⁶ See note 35.

³⁷ As said in the Workshop on technology development and transfer held in New Delhi, October 21, 2009, organised by the Government of India and the United Nations economic and social department. See for details, <http://www.twinside.org.sg/title2/gtrends/gtrends272.htm>, accessed on July 18, 2010.

³⁸ See for details, Bernice Lee, Ilian Iliev and et al, Who Owns Our Low Carbon Future? Intellectual Property and Energy Technologies, A Chatham House Report, September 2009, available at http://www.chathamhouse.org.uk/files/14699_r0909_lowcarbonfuture.pdf (accessed on April 1, 2010).

³⁹ Copenhagen Climate Conference and Patents, available at <http://www.ipeg.eu/blog/?p=838>, accessed on February 15, 2010.

⁴⁰ See note 39.

⁴¹ This is quoted from the writing of Mahatma Gandhi, *An Autobiography or The Story of My Experiments with Truth*, 1929. This quote is mostly used as a principle of non-violence movement. Although Mahatma Gandhi was not the originator of the principle of non-violence, he was the first to apply it in the political field on a huge scale. Mohandas Karamchand Gandhi (2 October 1869– 30 January 1948) was the pre-eminent political and spiritual leader of India during the Indian independence movement. He was the pioneer of *satyagraha*—resistance to tyranny through mass civil disobedience, a philosophy firmly founded upon *ahimsa* or total nonviolence—which led India to independence and inspired movements for civil rights and freedom across the world.

⁴² See for details, Singapore Declaration on Climate Change, Energy and Environment, available at <http://www.aseansec.org/21116.htm> (accessed on May 3, 2010).

⁴³ Transfer mechanism whereby governments or international institutions require the holder of IPR to extend licensing to grant use to the state or others. Usually, the holder does receive some royalties, either set by law or determined through some form of arbitration or court procedure. Compulsory licensing is widely disliked by private sector firms who argue that it prevents them from control and therefore reduces incentive to invest in potentially crucial technologies. See for details: Cosbey, A. (Ed.), (2008). *Trade and Climate Change: Issues in Perspective*. Winnipeg: International Institute for Sustainable Development.

⁴⁴ Copenhagen Economics A/S and The IPR Company A/S, "Are IPR a Barrier to the Transfer of Climate Change Technology?" Copenhagen (19 January 2009), p.7.

⁴⁵ The Group of 77 at the United Nations is a coalition of developing countries, designed to promote its members' collective economic interests and create an enhanced joint negotiating capacity in the United Nations. There were 77 founding members of the organization, but the organization has since expanded to 130 member countries. The group was founded on June 15, 1964 by the "Joint Declaration of the Seventy-Seven Countries" issued at the UNCTAD. This group may work as a coordinating body to represent the other developing countries except those that are included in the GE-10.

⁴⁶ In the IPCC Fourth Assessment Report, February, 2007 projections indicate that by 2020, between 75 and 250 million people in Africa will suffer an increase in water stress due to climate change. And the area of the continent suitable for agriculture is likely to decrease, particularly along the edges of semi-arid and arid regions. By 2020, yields from rain-fed agriculture in some countries could decrease by as much as 50%, exacerbating malnutrition and food security problems. What's more, rising water temperatures in large lakes may decrease fish stocks, again affecting food supplies. See for details, <http://www.ipcc.ch/ipccreports/ar4-wg1.htm>, accessed on September 1, 2010; Achim Steiner, executive director of the United Nations Environment Programme (UNEP) rightly put "Africa is the continent with the least responsibility for climate change and yet is perversely the continent with the most at risk if greenhouse gases are not cut." quoted in: African continent one of the most vulnerable to climate change, See for details, Environmental Research Web, Apr 11, 2007, available at <http://environmentalresearchweb.org/cws/article/opinion/27558>, accessed on August 25, 2010.

⁴⁷ Considering the vulnerability of African countries due to climate change as depicted in the IPCC Fourth Assessment Report, it should be represented as one of the most vulnerable groups. African Union may be invited to work as the united voice for African countries taking the experience from the EU. The African Union is an intergovernmental organization consisting of 53 African states. Established on 9 July 2002, the AU was formed as a successor to the Organization of African Unity (OAU). The prime objectives of AU and its different institutes are to accelerate the political and socio-economic integration of the continent; to promote and defend African common positions on issues of interest to the continent and its

peoples; to achieve peace and security in Africa; and to promote democratic institutions, good governance and human rights.

⁴⁸ Small Island Developing States (SIDS) were recognized as a distinct group of developing countries facing specific social, economic and environmental vulnerabilities at the United Nations Conference on Environment and Development (UNCED), also known as the Earth Summit, held in Rio de Janeiro, Brazil (3-14 June 1992). This recognition was made specifically in the context of Agenda 21 (Chapter 17 G). The UN recognizes the 38 UN Member States belonging to the Alliance of Small Island States (AOSIS), an ad hoc negotiating body established by SIDS at the UN. However, AOSIS has a membership of 42 States and observers, drawn from all oceans and regions of the world: Africa, Caribbean, Indian Ocean, Mediterranean, Pacific and South China Sea. Therefore, this alliance may become representative body of the small island states.

⁴⁹ The LDCs represent the poorest and weakest segment of the international community. Extreme poverty, the structural weaknesses of their economies and the lack of capacities related to growth, often compounded by structural handicaps, hamper efforts of these countries to improve the quality of life of their people. In the late 1960s, the UN began paying special attention to the LDCs, recognizing those countries as the most vulnerable of the international community. With the assistance from The UN Office of the High Representative for LDCs, Landlocked Developing Countries and Small Island Developing States, LDCs may proceed to take united voice for their problems and possible way outs for climate change adaptation and mitigation and required technologies. This office was established by General Assembly Resolution 56/227 as a follow-up mechanism to the Third UN Conference on the Least Developed Countries to ensure effective follow-up, implementation, monitoring and review of the implementation of the Programme of Action for the LDCs for the Decade 2001 – 2010, adopted at that conference.

⁵⁰ The UN Office of the High Representative for LDCs, Landlocked Developing Countries and Small Island Developing States may work as a coordinating body for the Vulnerable-5 considering their lack of bargaining and negotiation capacity.

⁵¹ In 2005, Canada proposed royalty guidelines for the export of medicines under the Jean Chrétien Pledge to

Africa Act, which implements the WTO waiver of Article 31(f) of the TRIPS Agreement. The Canadian royalty guidelines are a sliding scale of the generic sales price. The rate depends entirely upon the location of the importing market and the rank of the importing country in the UNHDI. The formula is one, plus the number of countries on the UNHDI, minus the importing country's rank on the UNHDI, divided by the number of countries on the UNHDI, multiplied by 0.04. The rate is then applied to the generic sales price. With 177 countries currently in the UNHDI index, the royalty rate can be expressed as: Royalty rate = $0.04 * [(178) - \text{rank importing country}] / 177$.

⁵² During the time of adoption of this royalty approach in 2004, the top rate was 4% of the generic sales price for Norway as it was number one country in HDI, 2004, and the lowest rate was 0.02%, for Sierra Leone as it was last country in the HDI, 2004.

Designing Substantive Patent Law: from Life Sciences to Climate Change?

Tine Sommer*

The purpose of this article is to emphasise that we have to learn from previous experience when addressing the issues of patent law and climate change in order to suggest appropriate solutions. If we address the problem while turning a blind eye to former failures we will never succeed. Especially in this area, where traditional environmental law and traditional patent law have had their glory days, there are lessons to be learnt by future lawmakers and policymakers working in the field of climate change.

1. Human health, climate change and patent law

A World Health Organization poster states that climate change hurts, not only in terms of environmental and economic damage, but also in terms of human lives.¹ The poster pictures a black foot on a cracked soil background, symbolising that drought hits harder in the undeveloped world where people are most likely to suffer from climate change.

Human lives are often at stake. That is why we have a huge pharmaceutical and biotech industry serving human needs as well as economic purposes. The history of safeguarding human lives worldwide is nothing to be proud of. In this regard, the patent law system has been identified as a major contributor to continuing health problems in the least developed countries. Our efforts to transfer patent laws to less and least developed countries have diminished the legitimacy of exclusive rights. What will happen when we add food and energy scarcity as well as climate change issues to our present experience of safeguarding humans? To be more specific, will

issues such as climate change demand special IPR treatment?

The lifecycle of patents can broadly be divided into two phases. Phase one, the *pre-grant* phase, covers the period from the filing of the patent application to the grant of the patent. Phase two, the *post-grant* phase, covers the period from the grant until the patent term expires (or lapses due to non-payment of fees). This article mainly addresses the *pre-grant* phase, the requirements for patentability and the balancing of public and private interests. However, *post-grant* measures are also important and will be briefly discussed.

2. Waves of law

As people get older, most discover that in some ways life repeats itself. Simple things, like the clothes they wore decades ago, come back into fashion and are reused by the new generation. Perhaps as lawyers get older, they too may wonder if law and policymaking repeat themselves and follow such *waves of life*, or '*waves of law*'. Some things never or seldom change, and one may ask if that is a sign of quality. Design classics, such as the Arne Jacobsen Egg Chair, seldom go out of date. Is patent law comparable to designer furniture? If that were the case, patent law would still be useful in a changed context, surviving the challenges of changing society without being swept away.

Although, the patent regime has expanded rapidly into parts of the world that do not have the infrastructure, capacity, or inventors to

benefit from the regime, its design has been absorbed in its traditional form, without fundamental changes. Furthermore, it has expanded to include new subject matter and embrace some of the emerging technologies. This expansion has triggered some changes in the wording of the European patent laws, but not a rethinking of the system. Business has continued as usual.

To elaborate on the *waves of law* metaphor which is the theme of this article, in the following there will be a focus on five developments in the law: the first wave is traditional international and EU environmental law; the second wave is traditional patent law and environmental law; the third wave is patent law and life sciences; the fourth wave is patent law and the biotech experience; and the fifth and final wave is patent law and climate change.

2.1. Traditional international and EU environmental law

By the early 1970s environmental law and policy had become a major issue. The UN Conference on the Human Environment, held in Stockholm in 1972, encouraged national and international societies to protect and improve the human environment.² The Stockholm Declaration (1972), and later the Brundtland Commission report (1987) on Environment and Development, *Our Common Future*, directed the world's attention to environmental law in its more modern form.³ By emphasising that pollution is not absorbed by air and water (and is not solved, for example, by building high chimneys or piping waste water into the ocean), and that it is likely to have cross-border effects, the focus on shared responsibility became a priority on the international agenda.⁴ In its different forms shared responsibility became an important issue in international environmental policy in the following years. Thus, the 2002 Johannesburg Declaration on Sustainable

Development assumed the existence of collective responsibility⁵ and most recently point 1 of the Copenhagen Accord 2009 emphasised the 'strong political will to urgently combat climate change in accordance with the principle of common but differentiated responsibilities and respective capabilities'.⁶

At the regional level, awareness of transboundary pollution and of the interplay between environmental policies and a competitive European industry was developed in the first place by the European Court of Justice and then by the adoption of the Single European Act in 1987. As a dynamic lawmaker, the European Court of Justice has contributed to the change of priority of environmental interests which was enshrined by the inclusion of Treaty provisions designed to protect the Environment, see the former EC Treaty, Articles 130r, 130s, 130t and Articles 100a(3) and (4).

This development continued. The Maastricht Treaty (1992) was also an important phase, with the Treaty *expressly* incorporating powers aimed at safeguarding the environment as part of its general principles in Articles 2 and 3 (referring to sustainable growth, for example). Furthermore, the Amsterdam Treaty (1997) contributed *by* changing the wording of the sustainability principle (Article 2: promoting a harmonious, balanced and sustainable development of economic activities), and *especially by* the promotion of the integration principle in Article 6.⁷ The latest stage in this agenda is the Treaty of Lisbon (2009) where not only has the Charter of Fundamental Rights of the European Union (2000)⁸ been replaced from the date of entry into force of the Treaty of Lisbon, but new provisions relating to climate change and energy have been adopted. See Article 191 in the consolidated version of the Treaty on the functioning of the European Union where Union policy on the

environment shall contribute to promoting measures at international level to deal with regional or worldwide environmental problems, and in particular combating climate change. In the context of Union energy policy Article 194, there is a reference to the need to preserve and improve the environment in a spirit of solidarity between Member States.

The Single European Act introduced Treaty-based environmental principles, such as the principle of a high level of protection, the principle of sustainable development, the integration principle, the precautionary principle, the prevention principle, the source principle, and the polluter pays principle. Since its introduction, scholars of European environmental law have debated the legal quality of the environmental principles of the Single European Act. The Act has not been followed by an immense body of case-law, but the European Court of Justice (ECJ) accepts that some of the principles are legally binding.⁹ In particular, Case C-284/95 *Safety Hi-Tech* has been highlighted as interpreting the former Article 130r. In paragraph 37 of its judgment, the ECJ stated that:

‘in view of the need to strike a balance between certain of the objectives and principles mentioned in Article 130r and of the complexity of the implementation of those criteria, review by the Court must necessarily be limited to the question whether the Council, by adopting the Regulation, committed a manifest error of appraisal regarding the conditions for the application of Article 130r of the Treaty’.

The discussion of environmental principles as legally binding is still ongoing, and it is important to remember this when considering the transfer of environmental principles to patent law.¹⁰ As Treaty-based principles they guide lawmakers, courts and, one can argue, authorities granting authorisations and exclusive rights.¹¹ In her legal writing *Astrid Epiney* has argued that all scholars, whether or not they support the binding

effect of principles, tend to focus on the legal significance of the principles. The purpose of an open-ended principle can require only the balancing of different interests.¹² On the basis of the environmental principles we may consider whether the requirement to integrate environmental protection as a general principle of EU law or the precautionary principle can be enforced at the level of the European Patent Organisation. This issue will be dealt with below.

The protection of the environment became subject to multi-level regulation already in 1972, and one can find interplay on environmental protection between lawmakers at the global, regional and national levels. However, in general terms the environmental focus peaked after *the Amsterdam wave*, emphasising the importance of environmental protection by promoting the integration principle as a general Community principle. Since then environmental protection has lived a more retired life, where compliance with and enforcement of European environmental law are issues that remain to be solved.¹³ However, climate change has brought the environment more into focus.

2.2. Traditional patent law and environmental law

Patent laws are not a new invention. National laws for reward schemes have been an integral part of industrial development since at least 1500.¹⁴ The overall idea of patents has been to balance society’s interests in new developments on the one hand and reward for inventors on the other hand. This is known as the reward doctrine.¹⁵ Thus the disclosure of how an invention works is an essential requirement for granting a patent for an invention. Substantive patent law has long been harmonised at the regional and international levels. Since 1972, the European Patent Convention (EPC) has provided a common system of law for the grant of patents,

and since 1994 the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) has provided detailed rules on substantive patent law and the enforcement of IPRs. Thus, as with environmental law, patent law is subject to multi-level regulation. Furthermore, the elements of balancing the interests in patent law and the interests of less and least developed countries can be recognised as issues in environmental law which can be classified as issues of social responsibility.

Turning to what may be termed 'traditional' patent law, one will find an attempt to reflect an express environmental focus. In this regard TRIPS contain more modern wording of patent law's traditional clause on exclusions from patentability on ethical grounds. The '*ordre public* and morality' clause, expressing environmental concern, is found as a minimum standard in TRIPS Article 27(2), which refers to the avoidance of 'serious prejudice to the environment'. As such, patent law supports an ethic norm that a law that rewards a polluting inventor is not good law.

The wording of TRIPS Article 27(2) suggests broader protection than Article 53(a) EPC. The wording is as follows:

TRIPS Art. 27(2): 'Members may exclude from patentability inventions, the prevention within their territory of the commercial exploitation of which is necessary to protect *ordre public* or morality, including to protect human, animal and plant life or health or to avoid serious prejudice to the environment...'

EPC Art. 53(a): European patents shall not be granted in respect of 'inventions the commercial exploitation of which would be contrary to "*ordre public*" or morality; such exploitation shall not be deemed to be so contrary merely because it is prohibited by law or regulation in some or all of the Contracting States.'

Despite the differences in wording, it must be pointed out that EPO case law, through the

interpretation of the *ordre public* standard, does make references to the environment.¹⁶ Thus, the *ordre public* standard of Article 53(a) EPC does constitute a bar to patentability for the exploitation of inventions that are *likely to seriously prejudice the environment*.

A relevant question in this regard is the extent of environmental protection taken into account by patent authorities. Do they consider sustainability and the precautionary principle and even make a risk assessment before granting a patent? An answer from the EPO Boards of Appeal in T 356/93, paragraph 18.5 hints at future decisions. The Board held that the *ordre public* standard presupposes that the threat to the environment is sufficiently substantiated at the time when the decision to revoke is taken by the EPO. The Board further emphasised that most of the applicant's arguments were based on the *possible* occurrence of harmful events (e.g. the transformation of crops into weeds, the spread of herbicide-resistant genes to other plants, damage to the ecosystem etc.). However, the documentary evidence must sufficiently substantiate the existence of a threat to the environment such as to represent a bar to patentability under Article 53(a).¹⁷

Thus it seems that the *precautionary principle* is far from being recognised by the EPO Boards of Appeal. The attitude is as follows:

'patent offices are placed at the crossroads between science and public policy. However, at this crossroads patent offices are not alone, but find themselves side-by-side with increasing number of other authorities and bodies, in particular regulatory authorities and bodies, whose function is inter alia to ensure that the exploitation of a given technology, *regardless of whether it is protected by a patent or not*, takes place within the regulatory framework provided by laws, international treaties, administrative provisions'.¹⁸

The exploitation of a patent has to be assessed within the framework of national laws and regulations on the use of an invention. The Board pointed out that potential risks cannot be anticipated merely on the basis of the disclosure of the invention in the patent specification. The balancing test elaborated in the *Harvard Onco Mouse* case¹⁹ is only applicable when there is an actual risk of harm in the form of 'conclusively documented hazards'.²⁰

It has been suggested that a patent examiner should require an environmental impact assessment from specialised authorities before granting a patent.²¹ As the results of such tests are usually not available to patent offices during the processing of a patent application, this would doubtless extend the period of patent application proceedings. Today, the actual approval by the authorities is often obtained *after* the grant of the patent. If we start requiring environmental impact assessments prior to the granting of a patent, we start mixing the exploitation of a patent with the grant, and too many grey areas will distort the objective of the patent system, subjecting it to even further problems of loss of legitimacy. Article 53(a) does not provide a legal basis for controlling and preventing technological hazards.²²

Following the discussion of environmental principles, one can hardly blame patent examiners or the Boards of Appeal if they do not rely on EU environmental principles which still are associated with legal uncertainty in their own legal system. As to the EPO, the EU has no legal power or authority over it.²³ Yet, the principle of sustainability in particular is not only a general principle of the EU, it is recognised in international conventions. This principle has the global aim ensuring that technological development does not bring about the end of the world and/or that the legal protection of

developments takes social responsibility into account. The author's opinion is that these principles are very useful in the post-grant phase, whereas the pre-grant phase must keep patent law to the straight and narrow, separating grant from exploitation.

2.3. Patent law and life sciences

The TRIPS Agreement's explicit reference to serious prejudice to the environment has been less controversial than its relation to *life saving medicine*.²⁴ We all know by now that the patent system *as such* is not transferable to less and least developed countries. The obvious question that scholars ask in this regard is whether the Doha process on pharmaceuticals has lessons for climate change. The focus is now on *post-grant measures* and there is an issue of accessibility, ensuring that IPRs do not unjustly prevent access to technologies.²⁵ One could say that post-grant measures are all about rebalancing the system and achieving global social goals.²⁶

Facilitating access to essential medicines in developing countries is an obvious starting point for assessing access by developing countries to environmentally sound technologies (ESTs). The Doha waiver enables a pharmaceutical product produced or imported under a compulsory licence in a member country to be exported to the markets of those other less or least developed countries that share the same health problem.²⁷ Thus, finding solutions to the barrier of *insufficient capacity* for developing countries to make effective use of compulsory licences, as in the case of HIV and malaria, can now be considered for environmentally sound technologies.²⁸

Comparing the UN Framework Convention on Climate Change (UNFCCC, 1992) to the Doha agenda appears to be straightforward. The distinction of less and least developed countries in Doha terms and UN Annex II Parties and non-

Annex I Parties guides us in the same direction, whether we talk about pharmaceuticals or combating climate change. The principle of common but differentiated responsibility is behind both systems in terms of technology transfer and financial resources. However, as emphasised by several scholars, it is questionable whether the feasibility of a waiver for the transfer of environmentally sound technologies is similar to that for public health. And unfortunately, the Doha process has only influenced the global pharmaceutical industry at the margin, so its structure and behaviour has been largely unaffected.²⁹ According to *Frederick Abbott*, at its best the Doha Declaration on the TRIPS Agreement and public health process has positively influenced governments and multilateral organisations towards taking greater responsibility for ensuring that populations and developing countries have adequate access to medicines.³⁰

Frederick M. Abbott points to one positive outcome of the WTO public health negotiations, which is that a number of Public Private Partnerships (PPPs) have been formed on drugs for neglected diseases, e.g. the Drug for Neglected Diseases initiative (DNDi), the US President's Emergency Program for African Relief (PEPFAR), and the WHO UNITAID scaling up access to treatment for HIV/AIDS, malaria and tuberculosis.³¹ There are now also orphan drugs arrangements in the EU for rarer diseases, such as Gaucher's disease, Fabry's disease.³²

Perhaps one of the lessons we can learn from the experience with *life saving medicines* for neglected diseases is to use Public Private Partnerships for *adaptation technologies* directed to the least developed countries.

2.4. Patent Law and the Biotech experience

Biotechnology has had an influence on several disciplines of law. As examined by *Han Somsen*, there are lessons to be learnt from environmental law, such as issues of risk regulation, where the precautionary principle has been acknowledged outside EU environmental law, as in the example of food safety regulation.³³ Risk assessment and the precautionary principle are appropriate as bases for voicing opposition on behalf of the environment and future generations when these are at stake.³⁴ This is also the approach of legitimacy.

Turning to patent law, we may consider *Han Somsen's* concept of 'genetic governance'.³⁵ The European Community had severe difficulties with the adoption of Directive 98/44/EC (the Biotech Directive). There was a 10 year struggle before the Directive was finally adopted in 1998. Patenting life forms caused much debate, mainly by establishing a regime without field restrictions. The biotech revolution has left its own footprint on substantive patent law, and this has led to the European Community making changes to the established EPO law. The author's view is that this is where we have learnt our lesson: Patent law flexibility and dynamic is not best safeguarded by detailed rules.

How can we cope with new patentable subject matter with patentability requirements that have been established at a time when the emerging technology (in this case biotech) was immature and when the political environment is reluctant and resistant to change, while the industrial lobby is positive about change? Now, as result of *a political compromise* we are locked into outdated rules. For example, there are rules that have created a phoney doctrine of isolation. Thus, Directive 98/44/EC Article 3(2), states that:

‘Biological material which is isolated from its natural environment or produced by means of a technical process may be the subject of an invention even if it previously occurred in nature’.

This doctrine governs biological material in general, as well as human genes; see Article 5(2):

‘An element isolated from the human body ... may constitute a patentable invention, even if the structure of that element is identical to that of a natural element.’

Comparing the patentability requirements to those of traditional patent law, the requirement for industrial application is the only criterion that has adopted a kind of field restriction, if it is to be interpreted as a strict requirement for industrial application.³⁶ Directive 98/44/EC, Article 5(3) states:

‘The industrial application of a sequence or a partial sequence of a gene must be disclosed in the patent application’

While the focus of the debate was on human genes, the Directive was adopted without changes to the patentability of plants and animals. Plant and animal varieties are excluded from patentability if the technical feasibility of the invention is confined to a particular plant or animal variety (Directive 98/44/EC, Article 4(2)). Essentially biological processes for the production of plants or animals are excluded. Essentially biological processes are defined in the Directive, which is not the case in traditional patent law. However this definition is more open-ended than precise.³⁷

Finally, the *worst outcome of law making* is the EU system creating its own detailed moral standard for Europe. Article 6(1) of the Directive repeats EPC Article 53(a), and Article 6(2) is as follows:

‘On the basis of paragraph 1, the following, in particular, shall be considered unpatentable:

(a) processes for **cloning** human beings;

(b) processes for **modifying** the germ line genetic identity of human beings;

(c) uses of **human embryos** for industrial or commercial purposes;

(d) processes for **modifying the genetic identity of animals** which are likely to cause them suffering without any substantial medical benefit to man or animal, and also animals resulting from such processes’ (emphasis added).

Given the heading of Article 6(2), it is obvious that one or more areas are missing. The non-exhaustive list provides examples concerning humans or animals used for human purposes (mainly) but there is not a word on environmental protection.³⁸ Maybe the EC legislator found this was already covered by the traditional clause (Article 6(1)) or perhaps the focus was more on human genes – ‘genetic governance’ in the term of Han Somsen.

2.5. Patent law and climate change

Climate change has been on the EU agenda for more than 20 years, and the EU is a major player on the international scene.³⁹ However, as pointed out by *Streck and Freestone*, the ‘implementation gap’, which is always a big problem of European environmental policy, is particularly obvious in the context of climate change.⁴⁰

With this background to patent law, the question is whether a change in the regulatory environment is necessary. Can patent law repair what environmental regulation cannot? Are we explicitly to make our patent law system ensure the reduction of green house gas emissions? Or should we emphasise that patent law favours environmentally sound technologies, or at least add environmental damage to our detailed moral standard? One could ask whether patent law is neglecting its social responsibility if it does not act to deal with climate change.

Patent law must develop in line with developments in society, and the surrounding legal society often collides with patent law, requiring the outdated regime to hang on for dear life. But if *real life* requires the adoption of new rules, the experience from the biotech adventure warns us that EC interference with the current state of patent law is not to be wished for. The provisions on isolated DNA sequences as patentable subject matter have revealed legal uncertainty and the different approaches of the EU Member States.⁴¹ France, Italy and Germany have a strict requirement for industrial application of gene sequences, and France also prohibits patents on sequences themselves. The EU Commission has been very reluctant to adopt a position and as a result it has been left to national courts to interpret. The legal approach to this by the EU has been a failure, and the EPO and the EU are stuck with the outdated and mistaken creation of patent law. The USPTO 2000 Utility Guidelines as a supplement to the US statute, and the case law approach in the USA seems better able to adapt smoothly to shifting directions as to the patentability of gene technology on different grounds (35 US §§ 101, 102 or 103). Lately, in a case before the United States District Court – Southern District of New York⁴² in March 2010, the claimed isolated DNA was not markedly different from DNA existing in nature, and was therefore not patentable under 35 U.S.C § 101. Detailed regulation of the patentability of emerging technologies is not an appropriate solution, but the case law approach adapts smoothly to developments. If pre-grant conditions are concise, this may also affect blocking patents as a narrower scope of protection will diminish the blocking effect of a patent.

So far patent law has collided with trade aspects of IPRs, environmental concerns, access to pharmaceuticals for least developed countries,

biotech and ethical issues. What has been learnt so far is that when global concerns are at stake patent law often lacks legitimacy. These collisions have had the major impact on the patent regime that it has lost its legitimacy, stuck between efforts to adopt new approaches and failing to do so. The outcome has been devastating to the scope of protection and quality of the patents issued. *This lesson is worrisome* when we now return to climate change. It seems that exactly the same components are present – law and policymaking repeats itself. And one can ask, do we need new rules favouring green inventions and creating uncertainty? The answer depends on which phase we address: the pre-grant phase or the post-grant phase.

To answer the question regarding the *pre-grant phase* it is necessary to focus on the nature of the environmentally sound technologies which ask for legal protection.⁴³ When referring to environmentally sound technologies, environmental lawyers think of adaptation and mitigation technologies. The former includes regional and local climate modelling, early warning, coastal zone management, water resources, agriculture and public health. The latter, mitigation technologies, includes energy supply, carbon dioxide capture and storage, and technologies for the reduction of green house gas emissions.⁴⁴ Today *feasible technologies are available*, but not all are commercially competitive without government or other support.⁴⁵ We have to identify the key barriers to more rapid development and deployment of *state-of-the-art* technologies and mechanisms that can accelerate these processes.⁴⁶

Patent law today already embraces improvements and new technologies on turbine blades,⁴⁷ different sorts of clean technologies,⁴⁸ climate-tolerant crops for developing countries such as drought resistant crops, flood resistance, salt

resistance, sea grass and other crops for bio fuels can be protected. Clean farm animals are being developed, such as pigs (not a contradiction but a difference in genetic make-up); enviro-pigs expel up to 60 per cent less phosphorus than their non-transgenic counterparts.⁴⁹ A naked or featherless chicken is being genetically engineered, saving poultry farmers large amounts of money on ventilation to prevent their chickens from overheating.⁵⁰ Isolated and clean human genes may also be patented if we find solutions for enhancing the human metabolism in order to make humans eat less or perhaps dislike meat.

Against this background is it really necessary to regulate patent law in detail, given that patentable subject matter today generally covers environmentally sound technologies? There are several options for amending patent law, however taking previous experience into account, patent law must be kept to the straight and narrow.

One option is to insert environmental principles and objectives in patent law conventions, either as mission statements or terms in the preamble. The *mission statement option* is a preamble text in European and international patent conventions referring to internationally recognised environmental principles which, as a measure of global legitimacy, patent law has to respect.⁵¹ The preambles are to be respected by signatory states as parties to the conventions. Starting with environmental principles, the most suitable principles are the principle of sustainability and the precautionary principle. The sustainability principle is globally recognised and it seems to be behind almost every piece of environmental legislation or climate change regulation today. As such, the principle is very suitable for being inserted in a preamble giving a political signal that patent law aims to promote technologies that can preserve the world for future generations.

The precautionary principle is more connected to risk assessments, and perhaps this is most useful as a guiding principle for granting authorisations. However, one way to use the principle and that is for regulating the scope of protection.⁵² If patent examiners are faced with applications on new emerging technologies, it might be appropriate to limit the scope of protection, and not to grant a product patent. Climate change has its own principles. Apart from the principles of sustainability and the precautionary principle, the most commonly referred to principle is that of common but differentiated responsibility. In his opening speech at the conference on 'Regulation Global Concern' in Sandbjerg, May 2010, *Thomas Cottier* addressed climate change as a *common concern of mankind*.⁵³ He pointed out that the principle is treaty-based and defined. Referring to the concept of a common concern of mankind in patent convention preambles may prompt awareness of the importance of a regulated *post-grant phase* such as a waiver-option for environmentally sound adaptation technologies for least developed countries.

Thomas Cottier has also written about the Doha Waiver and the amendment of TRIPS as introducing 'a new dimension to intellectual property and competition law: they reflect concerns for human rights, in particular the right to health and right to life....The right to health and life entail components of distributional justice which intellectual property and competition laws per se should support and assist in realization'.⁵⁴

The *option of changing the wording* can work in several ways. Patent law provisions on patentability can favour inventions of environmentally sound technologies or can fast-track processing of such patent applications.⁵⁵ The fast track option has gained ground since 2009. The United Kingdom and the USA have

introduced a fast track system for green technology. The former has an accelerated procedure called the 'Green Channel' and the latter has a more detailed system.⁵⁶ This is a burden on the patent examiner but nothing indicates that a petty patent is the outcome. Some also argue that the term of protection for environmentally sound technologies ought to be extended or the fees reduced.⁵⁷

The open question is how to make environmental impact assessments of a technology during the processing of a patent application without leaving patent examiners behind. *Estelle Derclaye* has argued that patentees ought to calculate the carbon footprint of their products.⁵⁸ Legislators just have to decide a standard, as in environmental law, and make it applicable to patents. She argues that for products it will be relatively simple, such as a reduction of emissions below a threshold in order to get favoured treatment.⁵⁹ One very promising option is to ask the patent applicant to disclose information about the environmental impact voluntarily. The only effect of this requirement would be at the infringement stage or in opposition proceedings.⁶⁰ This is a familiar approach, recalling the disclosure of origin of genetic resources.⁶¹

The *moral standard option* merely requires the addition of a new subparagraph (e) to the list in Directive 98/44/EC, Article 6(2), covering processes that are likely to cause harm to the environment. Adding the likelihood of harm relates to the precautionary principle.

3. Conclusion

As emphasised in the first section of this article, it is necessary to learn the lessons from environmental and biotechnology regulations, as well as from patent law when designing regulations on climate change. It is useless to

repeat environmental principles that no one relies on and think that this is how to solve climate change problems. It is also useless simply to amend patent law with highly specific and detailed rules on environmentally sound technologies. As the biotech experience must have taught us, this may only lead to confusion and disharmony. The biotech lesson in particular, with its mix of competences between the EU and the EPO, is not the way forward. Until we adopt an EU patent, with its own patent Court of Justice, this area must be settled at the level of the EPO or the WTO.

To return to the starting point, it can be concluded that the shape of patent law is still good law. We can have a dynamic patent law system by keeping patent law to the straight and narrow. Patent law can adapt to the changing nature and pace of technology if we keep patentability standards straight and thereby restore its global legitimacy. The case law approach can be guided by terms in preambles, but to suggest that patent examiners should ask for technical advice or should address assessments long before the authorisation authorities are capable of doing so, is perhaps not the most appropriate solution. Patent law can consider the *common concern of mankind*. But amending pre-grant patent law cannot solve the emerging problems of lack of capacity and more urgent concerns in the least developed countries. In other words, patent law cannot save us from climate change.

We have to be open to new methods, other market-based instruments and guidance by means of taxation, fines and standards. Environmental rules are in themselves indirect incentives to promote clean technologies, and adding economic incentives may be more effective than amending *pre-grant* patent law. Given market forces, environmental regulation

has an impact on the kinds of inventions seeking protection, thereby reducing the global carbon footprint without changing the wording of patent law.

Why not consider a system awarding firms with prizes for technology transfer arrangements? The emphasis on climate change must put severe pressure on solving emerging problems in the least developed countries. To add common concern principles to patent convention preambles would reflect the social responsibility of patent law. Inventions benefiting a cleaner environment also benefit future generations and must be disseminated throughout the world. Efforts must be made to focus on adaptation technologies for the less developed world where people are most likely to suffer from climate change.

*Professor, PhD, Centre for International Business Law, Department of Business Law, Aarhus School of Business, Aarhus University This article is based on a presentation given at the Conference REGULATING GLOBAL CONCERNS, CLIMATE CHANGE AND INTELLECTUAL PROPERTY RIGHTS: Legal Frameworks and Institutions for the Development and Transfer of Environmentally Sound Technologies, 11-12 May, 2010, Sandbjerg Estate, Sønderborg, Denmark and at the Conference IPR 2030, IPR University Center 130 Years, Malta, 10-13, June, 2010.

¹ The WHO poster says: 'Climate change hurts, besides environmental and economic damage, the ultimate impact of climate change represents a toll on our most precious resource – human lives and health', see http://www.who.int/globalchange/multimedia/photos_posters/foot_corr.pdf.

² See New Challenge for the United Nations, OPI/433/-02726, February 1971.

³ The Stockholm Declaration was adopted on 16 June 1972; see Philippe Sand: Principles of international environmental law, p. 40.

⁴ See Philippe Sand: Principles of international environmental law, Ed. 2, 2003, p. 3; and Rudolf E. Blum, 'The Treat to our Environment and the Protection of Intellectual Property', in Industrial property and copyright: monthly review of the World Intellectual Property Organization, Geneva 1973, p. 243, for a

description of the problems to be faced, p. 244. See Staffan Westerlund, 'Theory for Sustainable Development; Towards or Against?', in Hans Chr. Bugge & Christina Voigt (eds.): Sustainable Development in International and National Law, pp. 54-56.

⁵ See The Johannesburg declaration at point 5: 'Accordingly, we assume a collective responsibility to advance and strengthen the interdependent and mutually reinforcing pillars of sustainable development – economic development, social development and environmental protection – at the local, national, regional and global levels',

http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/POI_PD.htm; and Marie-Claire Cordonier Segger, 'Sustainable development in International Law', in Hans Chr. Bugge & Christina Voigt (eds.): Sustainable Development in International and National Law, p. 87.

⁶ See Decision -/CP15 at

<http://www.um.dk/NR/rdonlyres/AA2E8765-4158-4BD1-B29E-1CEDC5BF2CCE/0/COP15CopenhagenAccord.pdf>.

⁷ In its original version the integration principle was inserted in Article 130r(2). See also Jan H. Jans and Hans H.B. Vedder: European Environmental Law, Ed. 3, Ch. 1, development and principles.

⁸ The principles of a high level of environmental protection, integration and sustainability are in Article 37 of the Charter.

⁹ See Astrid Epiney, in Richard Macrory (ed.): Environmental Principles, in Reflections on 30 Years of EU Environmental Law – A High Level of Protection?, pp. 20 and 21.

¹⁰ See Estelle Derclaye, 'Should patent law help cool the planet? An inquiry from the point of view of environmental law: Part 1', in EIPR. 2009, 31(4), pp. 168-184.

¹¹ Derclaye (n. 10) pp. 227-235; and Derclaye, 'Patent Law's role in the protection of the environment – reassessing patent law and its justifications in the 21st Century', in IIC 2009, 40(3), pp. 249-273.

¹² Epiney (n. 9) p. 21. For a more deterrent binding effect, see Estelle Derclaye, 'Not only Innovation but also Collaboration, Funding, Goodwill and Commitment: Which role for Patent Laws in Post-Copenhagen Climate Change Action', in 9 J. Marshall Rev. Intell. Prop.L 657 (2010), p. 659.

¹³ See Peter Pagh, 'The Battle on Environmental Policy Competence', in Richard Macrory (ed.): Reflections on 30 Years of EU Environmental Law. A High Level of Protection?, p. 5.

¹⁴ For justifications for patents, see Lionel Bentley and Brad Sherman, Intellectual Property Law, Ed. 3, p. 339;

and Nuno Pires de Carvalho: The TRIPS Regime of Patent Rights, Ed, 2, p. 9.

¹⁵ Nuno Pires de Carvalho: The TRIPS Regime of Patent Rights, Ed. 3, p. 31.

¹⁶ PGS/Basta T356/93, February 1995, Official Journal of the European Patent Office, 1995, 545, the concept of *ordre public* also encompasses the protection of the environment; see also Ulrich Schatz, 'Patents and morality', in Sigrid Sterckx (ed): *Biotechnology, Patents and Morality*, p. 222.

¹⁷ See T356/93 Plant cells/PGS; and Tine Sommer, 'Interpreting *ordre public* and morality in a patent law context: Which is the correct approach?', in *Bio-Science Law Review*, 2006/2007, 2 at p. 69.

¹⁸ See T 356/93 at points 18.2 to 18.4 of the decision; and Sommer (n. 17) p. 69.

¹⁹ Harvard/Oncomouse [1990] O.J. EPO 476.

²⁰ See Ulrich Schatz, 'Patents and morality', in Sigrid Sterckx (ed): *Biotechnology, Patents and Morality*, p. 222.

²¹ See Estelle Derclaye, 'Patent Law's role in the protection of the environment – reassessing patent law and its justifications in the 21st Century', in *IIC* 2009, 40(3), p. 258.

²² Schatz (n. 20) p. 222.

²³ See Tine Sommer, 'Interpreting *ordre public* and morality in a patent law context: Which is the correct approach?', in *Bio-Science Law Review*, 2006/2007, (2).

²⁴ See Frederick M. Abbott & Graham Dukes: *Global Pharmaceutical Policy, Ensuring Medicines for Tomorrow's World*, 2009, EE; Thomas Cottier, 'The Doha Waiver and Its Effects on the Nature of the TRIPS System and on Competition Law, The Impact on Human Rights', in Inge Govaere & Hans Ullrich (eds.): *Intellectual Property, Public Policy and International Trade*, at p. 175: 'a permanent regime of *lex specialis* on access to essential drugs in the TRIPS system of intellectual property protection'.

²⁵ See Meir Perez Pugatch, 'The process of intellectual property policy-making in the 21st century – shifting from general welfare models to a multidimensional one', in *EIPR* 2009 31 (6), p. 311.

²⁶ See e.g. Brad Sherman, 'Intellectual property and environmental protection', in *EIPR* 1991, 13(5), pp. 165-170 at p. 172.

²⁷ See Implementation of paragraph 6 of the Doha Declaration on the TRIPS Agreement and public health, Decision of the General Council of 30 August 2003, cf. Article 6 (i). Article 7, first sentence, adds that Members recognise the desirability of promoting the transfer of technology and capacity building in the pharmaceutical

sector in order to overcome the problem identified in paragraph 6 of the Declaration.

²⁸ See Frederick M. Abbott, 'Innovation and Technology Transfer to Address Climate Change: Lessons from the Global Debate on Intellectual Property and Public Health', *ICTSD*, Issue paper No 24.

²⁹ Abbott (n. 28) p. 14.

³⁰ The waiver is still on the agenda. The TRIPS Council Meeting in June 2010 is set to review the little-used waiver, and boost availability of affordable medicines in developing countries, see <http://www.ip-watch.org/weblog/2010/05/31/drug-access-waiver-debate-looms-for-june-trips-council-meeting/>.

³¹ Abbott (n. 28) p. 13.

³² Abbott & Dukes (n. 24) p. 133 f.

³³ See Han Somsen, 'Some reflections on EU Biotechnology Regulation', in Richard Macrory (ed.): *Reflections on 30 Years of EU Environmental Law. A High Level of Protection?*, p. 329.

³⁴ Somsen (n. 33) p. 333.

³⁵ Somsen (n. 33) p. 335.

³⁶ For this discussion see, Tine Sommer, 'Scope of Gene Patent Protection and the TRIPS-Agreement – An Exclusively Nondiscriminatory Approach?', in *IIC* 1/2007.

³⁷ See Tine Sommer, 'Patenting the Animal Kingdom? From Cross-Breeding to Genetic Make-up and Biomedical Research', in *IIC* 2/2008, p. 149 ff.

³⁸ The recital 10 in the preamble to the Directive states that regard should be had to the potential of the development of biotechnology for the environment and in particular the utility of this technology for the development of methods of cultivation which are less polluting and more economical in their use of ground; whereas the patent system should be used to encourage research into, and the application of, such processes. Furthermore recital 11 addresses developing country issues, and recital 36 refers to TRIPS Article 27(2).

³⁹ See Charlotte Streck & David Freestone, 'The EU and Climate Change', in Richard Macrory (ed.): *Reflections on 30 Years of EU Environmental Law. A High Level of Protection?*, p. 87.

⁴⁰ Streck & Freestone (n. 39) p. 88.

⁴¹ For this discussion see, Tine Sommer, 'Scope of Gene Patent Protection and the TRIPS-Agreement – An Exclusively Nondiscriminatory Approach?', in *IIC* 1/2007.

⁴² See Case 1:09-cv-04515-RWS, document 255, filed 3/29/2010: American Civil Liberties Union Foundation and Public Patent Foundation.

⁴³ See The new 'tagging clean energy' database created as part of a joint study on IP and climate change mitigation technologies carried out by the United Nations Environment Programme (UNEP), the EPO and the International Centre for Trade and Sustainable Development (ICTSD): <http://www.epo.org/topics/news/2010/20100611.html>.

⁴⁴ See Background paper: Climate Change: Technology Development and Technology Transfer, Beijing High-level Conference on Climate Change: Technology Development and Technology Transfer, Beijing, China, 7-8 November 2008, UN Department of Economic and Social Affairs, pp. vii, viii, and 2.

⁴⁵ Background paper (n. 44) p. 2 f.

⁴⁶ Background paper (n. 44)

⁴⁷ See for example US 2010/0135806 A1: a wind turbine blade includes a plurality fins, each fin rotatably-joined to a tip of the blade.

⁴⁸ Cf. <http://greenenergyreporter.com/2010/06/8696/>.

⁴⁹ Sommer (n. 37).

⁵⁰ <http://www.nytimes.com/2002/05/24/world/rehovot-journal-cluck-cluck-chickens-in-their-birthday-suits.html>. Although due to prior art it is not patentable.

⁵¹ See in general a proposal for a mission statement as a clear statement of the purpose of the patent system that might facilitate decisions on whether to include new subject matter under the patent system, and might be a valuable source of reference in court cases on patent related matters, STOA, Policy Options for the Improvement of the European Patent System (IP/A/STOA/FWC/2005-28/SC16 at page 33.

⁵² See also 'The future of the patent system', The Danish Board of Technology, page 22 <http://www.tekno.dk/subpage.php3?article=1132&topic=kategori11&language=uk>.

⁵³ UN GA Resolution 43/53, 1988: The UN Framework Convention on Climate Change, UNFCCC, in its preamble stated that changes in the Earth's Climate are a common concern of humankind, and the Convention on Biological Diversity, CBD, stated that the conservation of biological diversity is a common concern of humankind. See Thomas Cottier and Sofya Matteotti-Berkutova, International environmental law and the evolving concept of 'common concern of mankind' in Thomas Cottier, Olga Nartova & Sadeq Z. Bigdeli (eds.): International Trade Regulation and the Mitigation of Climate Change, p. 38.

⁵⁴ Thomas Cottier, 'The Doha Waiver and Its Effects on the Nature of the TRIPS System and on Competition Law, The Impact on Human Rights', in Inge Govaere & Hans Ullrich (eds.): Intellectual Property, Public Policy and International Trade, p. 198

⁵⁵ See the USPTO pilot project, http://www.uspto.gov/patents/init_events/green_tech.jsp. For the UK, see <http://www.ipo.gov.uk/pro-types/pro-patent/p-law/p-pn/p-pn-green.htm>.

⁵⁶ See Estelle Derclaye, 'Not only Innovation but also Collaboration, Funding, Goodwill and Commitment: Which role for Patent Laws in Post-Copenhagen Climate Change Action', in 9 J. Marshall Rev. Intell. Prop.L 657 (2010), pp. 662-661.

⁵⁷ Derclaye (n. 10) pp. 227-235; and Derclaye, 'Patent Law's role in the protection of the environment – reassessing patent law and its justifications in the 21st Century', in IIC 2009, 40(3), pp. 249-273.

⁵⁸ EIPR/IIC. See also Derclaye (n. 56) p. 660.

⁵⁹ Derclaye (n. 56) p. 660.

⁶⁰ See Carolyn Abbott & David Booton, 'Using Patent Law's teaching Function to introduce an Environmental Ethic into the Process of Technological Innovation', in 21 Geo. Int'l Env'tl. L. Rev. 219 (2009), pp. 248-249, cited in Estelle Derclaye, 'Not only Innovation but also Collaboration, Funding, Goodwill and Commitment: Which role for Patent Laws in Post-Copenhagen Climate Change Action', in 9 J. Marshall Rev. Intell. Prop.L 657 (2010), p. 660.

⁶¹ See e.g. the preamble to Directive 98/44/EC, recital 27.

Opportunities and Constraints for Cooperation between International Organisations

*Catherine Rhodes**

This paper provides an examination of opportunities for and constraints on cooperation between international organisations, which is an increasingly important form of governance. Two case studies are presented which have relevance to the issues of intellectual property and climate change. These represent an established governance area (genetic resources) and an emerging area (biofuels).

1. Introduction

An increasing number of global challenges – including climate change – cut across the remit of several international organisations¹ and require coordination between these organisations to be effectively addressed. The first part of the paper provides a general outline of opportunities and constraints faced by international organisations when they need to cooperate on issues of joint concern. When such cooperation is not achievable this can result in a number of problems including tensions, contradictions, imbalances and duplication of efforts – all of which reduce the effectiveness of international action. The second part of the paper will explore the governance of two issues – genetic resources and biofuels – as case studies of international organisations' responses to cross-cutting issues.

2. Cooperation between international organisations

State action benefits from cooperation in areas where there is a high degree of international interdependence, i.e. those in which separate action by individual states will be insufficient to address issues of common concern. Issues that fall within the jurisdiction of more than one

international organisation require the development of cooperative activities in order to promote balance and coherence in policy approaches. Such activities are an increasingly significant governance mechanism, particularly because of the long time periods and complex negotiations necessary to amend existing or develop new regulations.²

International rules³ and other governance mechanisms fulfil various functions in relation to the coordination of state action including:

- *Defining rights and obligations;*
- *Providing predictability and reducing uncertainty;*
- *Reducing the costs of individual action and increasing efficiency;*
- *Authorising or prohibiting certain actions;*
- *Establishing and shaping expectations;*
- *Imposing constraints;*
- *Channelling conflict and providing mechanisms for its resolution;*
- *Simplifying and facilitating transactions; and*
- *Assisting or directing policy-making.*⁴

Coherent policy and regulatory approaches by international organisations are important for fulfilment of these functions wherever a set of rules and/or institutions cover a particular issue area. In situations of uncertainty states are unlikely to act in a coordinated manner, and will face uncertainty in policy making where approaches are incoherent.⁵ For example: states may be unclear about which rules they should be applying and which other states will apply;

where there are contradictions between approaches states will be unclear on their rights and obligations; and where there is competition over the values used in different organisations uncertainty will increase.⁶ Duplication of action is also likely to occur with resulting reductions in efficiency. This means that in the absence of inter-organisational cooperation to govern a cross-cutting issue, state action will not be effectively coordinated.

3. Inter-organisation cooperation – opportunities

Opportunities for cooperation between international organisations arise from overlaps between issue areas, regulations and organisational scope and are provided by mandates and mechanisms granted to the organisations by their member states. Overlaps represent both opportunity and need for inter-organisational cooperation. Climate change, for example, involves areas such as environment, development, trade, energy, transport, biodiversity, agriculture, water, health, and science and innovation. It is, therefore, a matter of interest to several international organisations including *inter alia*: the Convention on Biodiversity (CBD) Secretariat, Food and Agriculture Organisation (FAO), Intergovernmental Panel on Climate Change (IPCC), United Nations Environment Programme (UNEP), World Bank, World Health Organisation (WHO), World Meteorological Organisation, and World Trade Organisation (WTO). To give an illustrative example, an overlap between the substances covered by the United Nations Framework Convention on Climate Change (UNFCCC) and the Montreal Protocol on Substances that Deplete the Ozone Layer produces an opportunity and need for inter-organisation coordination to avoid conflictual approaches. Cooperative work has taken place,

through the Meeting of the Parties to the Montreal Protocol and the UNFCCC's Subsidiary Body on Scientific and Technical Advice in relation to hydrofluorocarbons and perfluorocarbons.⁷

Mandates and mechanisms for cooperation can be readily identified through examination of relevant documents produced by the organisations. These include their constitutional documents, the texts of relevant regulations and formal cooperation agreements. Constitutional documents show that awareness of a potential need to cooperate has often been present from an organisation's foundation:

*"The Organization shall establish effective relations and cooperate closely with such other inter-governmental organizations as may be desirable."*⁸

*"In order to provide for close cooperation between the Organization and other international organizations with related responsibilities, the Conference may enter into agreements with the competent authorities of such organizations."*⁹

An extensive range of cooperative mechanisms have been granted to international organisations by their member states at varying levels of formality – from basic information provision through to joint action projects. The (non-exhaustive) list provided below gives examples of mechanisms available to the Food and Agriculture Organisation and World Health Organisation, which are broadly representative of the mechanisms available to international organisations:¹⁰

- *Observerships;*
- *Joint committees, working parties and missions;*
- *Joint meetings and conferences;*
- *Joint action projects and work programmes;*
- *Formal cooperative arrangements;*

- *Informing other organisations about implementation matters;*
- *Information, knowledge and document exchange;*
- *Inter-secretariat committees;*
- *Interchange of personnel;*
- *Cooperation on the establishment of regional and branch offices;*
- *Reciprocal representation at meetings;*
- *Transmission of resolutions and recommendations;*
- *Delineation of areas of responsibility;*
- *Joint technical support and educational activities;*
- *Coordination of research;*
- *Cooperation in preparation of official documents;*
- *Collaboration on technical assistance and provision of technical advice;*
- *Statistical cooperation;*
- *Suggestion of agenda items; and*
- *Where appropriate, taking on the functions of another organisation.*

4. Inter-organisation cooperation – constraints

Even in situations where there are clear needs and opportunities for cooperation it does not necessarily take place. It may also take place only at a very basic and informal level with limited impact on practice. This can be explained by the constraints faced by international organisations when they need to cooperate.¹¹

These constraints¹² include:

Jurisdiction: Organisations may limit cooperative activities because of concern about encroaching on or competing with another organisation's area of jurisdiction. They may also be reluctant to cooperate where it is perceived as giving up 'control' of an issue, particularly if this could have financial implications.

Resources: Two main types of resource constraint can impede cooperation. The first is financial – an organisation may be unwilling to take on the additional costs of addressing a new issue; they are generally insufficiently funded for the tasks they already have. The second relates to expertise – an organisation may be reluctant to take on an issue in which it lacks relevant expertise and experience. (It is worth noting that converse dynamics may also operate in these situations as organisations may choose to cooperate in order to share costs and expertise.) Most formal cooperation agreements made between international organisations include cost-sharing arrangements. An example is the following clause from a cooperation agreement between the Food and Agriculture Organisation and World Health Organisation:

"If compliance with a request for assistance made by either organization to the other involves or would involve substantial expenditure for the organization complying with the request, consultation shall take place with a view to determining the most equitable manner of meeting such expenditure."¹³

Other Constraints: Other constraints include: structural issues such as incompatible bureaucracies and working practices;¹⁴ the effects of individual personalities within the organisation; lack of practical experience in cooperation; and the level of cooperation between national government units which do not always coordinate their negotiating positions and so may end up adopting divergent approaches in different organizations.¹⁵

Attitudes and Actions of Member States: This appears to be the most significant form of constraint on inter-organisational cooperation. International organisations are created by states to serve their interests. While they may be granted limited autonomy of action, ultimately it is for states to decide whether cooperation takes place on a particular issue, the extent of this

cooperation and the effects it can have on action. States are generally the main resource providers for international organisations; they set the organisation's agenda, prioritise issues, and are the main decision-makers. They are also responsible for implementing decisions.

States are likely to have differences of opinion about the desirability of cooperation on any particular issue and so power relations matter in determining outcomes. Reasons that states may choose to block inter-organisation cooperation include: that an issue is too politically sensitive; that due to power dynamics they want only one particular forum to deal with the issue; that they are not ready to move the issue to the international level; and their overall negotiating position within an international organisation. Particularly in complex ongoing negotiations, such as those in the climate regime, states often link ostensibly unconnected issues within a bargaining process, so that a decision not to allow cooperation on an issue might be unrelated to judgements on its merit.¹⁶ Many states also continue to conceive national interest narrowly in terms of short-term political and economic advantage, which can limit their willingness to support effective international cooperation.

5. Case study of cross-Cutting governance – genetic resources

Genetic resources have been the subject of international governance since the 1950s, which has expanded from a narrow focus on collection and exchange of plant genetic material involving one international organisation – the Food and Agriculture Organisation – to incorporate a number of other concerns, including equity, benefit-sharing, conservation and intellectual property rights, of interest to several international organisations.

Genetic resources are defined in the Convention on Biodiversity¹⁷ as “genetic material of actual or potential value” (and genetic material as “any material of plant, animal, microbial or other origin containing functional units of heredity”). Advances in the life sciences over the past few decades have meant that the range of genetic material considered to have ‘actual or potential value’ has expanded rapidly and this has been reflected in the expansion of areas of concern internationally.

The international organisations involved in the governance of genetic resources include: the Food and Agriculture Organisation – which has worked on plant genetic resources since the 1950s; the Union for the Protection of New Varieties of Plants (UPOV) established in 1961 to give protection to plant breeders’ rights; the United Nations Environment Programme, established in 1972; the Convention on Biodiversity Secretariat, established in 1992; the World Trade Organisation, established in 1995; the World Intellectual Property Organisation (WIPO), which has been engaged in the area since the late 1990s; and the World Health Organisation, particularly since 2007.

These organisations between them cover the issues of: facilitation of access to genetic resources through collection and exchange; conservation; development and food security concerns; fair and equitable benefit-sharing; effects of intellectual property rights on access and benefit-sharing; human rights; and sharing of viral genetic resources for health research. The main rules, mechanisms and institutions that have been developed are listed in Table 1 (a list of acronyms is provided at the end of the paper).

Table 1. Rules, Mechanisms and Institutions for the Governance of Genetic Resources

Rule/Mechanism/Institution	Associated Organisation(s)	Year
Seed exchange mechanism; World List of Plant Breeders; and catalogues of genetic stocks.	FAO	1950s
Convention on the Protection of New Varieties of Plants	UPOV	1961
Consultative Group on International Agricultural Research	FAO, UNDP, World Bank	1971
International Undertaking on Plant Genetic Resources	FAO	1983
Commission on Genetic Resources for Food and Agriculture	FAO	1983
Convention on Biodiversity	CBD Secretariat	1992
Bonn Guidelines on Access to Genetic Resources	CBD Secretariat	2002
International Treaty on Plant Genetic Resources	FAO	2001
Multilateral System of Access and Benefit Sharing (under the ITPGR)	FAO	Operational in 2007
Agreement on Trade Related Aspects of Intellectual Property Rights	WTO	1995
Review process for Article 27.3(b) of TRIPS Agreement	WTO	Ongoing
Stakeholder consultations on intellectual property and genetic resources	WIPO	1998-1999
Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (IGC)	WIPO	2000
Database of intellectual property licensing provisions relating to access to genetic resources	WIPO-IGC	in progress
Draft Intellectual Property Guidelines for Access and Equitable Benefit-Sharing	WIPO-IGC	2004
Declaration and Global Plan of Action on Animal Genetic Resources	FAO	2007

In the near future it is expected that an international regime on access and benefit-sharing will be agreed by the Conference of the Parties to the CBD and an international legal instrument for the protection of genetic resources, traditional knowledge and traditional cultural expressions is currently being developed by WIPO's Intergovernmental Committee.

The World Health Organisation has taken an interest in the area of access to genetic resources and intellectual property rights in relation to public health research on viruses. It raised concerns about the effects of patenting of the SARS virus and its genes on research in 2003,¹⁸ but it was in 2007 that major problems were encountered in relation to avian influenza.

Indonesia temporarily stopped supplying samples of the virus to WHO Collaborating Centres¹⁹ due to concerns that vaccines or other medical products produced by private groups from research on the virus would not be accessible to its population.²⁰ This can be viewed as a restriction on access to genetic resources due to concern that benefits would not be shared equitably. An *Interim Statement* produced by WHO in November 2007²¹ noted that: “there has been a breakdown in trust in this essential system of the international collaboration and collective action” relating to “sharing of viruses and specimens, the development and production of preventive and curative measures such as vaccines and antivirals” and that “the current system does not deliver the desired level of fairness, transparency and equity”.

WHO’s work to resolve this issue has included organisation of an Intergovernmental Meeting on Pandemic Influenza Preparedness, which established: a traceability mechanism – the Influenza Virus Tracking System; an advisory mechanism; and an Open-Ended Working Group on Pandemic Influenza Preparedness. The Working Group produced a *Draft Pandemic Influenza Preparedness Framework for the Sharing of Influenza Viruses and Access to Vaccines and Other Benefits* in 2009.²²

The collection and use of human genetic material is covered by three declarations of the United Nations Educational, Scientific and Cultural Organisation (UNESCO) – the Universal Declaration on the Human Genome and Human Rights; the International Declaration on Human Genetic Data; and the Universal Declaration on Bioethics and Human Rights. Each contains a clause on access and benefit-sharing, with, for example the Universal Declaration on the Human Genome and Human Rights stating that: “Benefits from advances in biology, genetics and

medicine, concerning the human genome, shall be made available to all, with due regard for the dignity and human rights of each individual.”²³

5.1. Cooperative initiatives

Examples of cooperative initiatives in genetic resources governance include:

- *The Consultative Group on International Agricultural Research – established by the FAO, United Nations Development Programme (UNDP) and World Bank in 1971. It aims to “reduce poverty and hunger, improve human health and nutrition, and enhance ecosystem resilience through high-quality international agricultural research, partnership and leadership.”*²⁴ *The international agricultural research centres supported by Consultative Group have now placed their resources under the multilateral system of the International Treaty on Plant Genetic Resources. These centres hold “over 650,000 samples of crop, forage and agroforestry genetic resources in the public domain”.*²⁵
- *The Convention on Biodiversity Secretariat shares information (a basic form of cooperative activity) through provision of a database on access and benefit-sharing measures, a set of case studies on access and benefit-sharing, and a roster of experts on access and benefit-sharing. The CBD’s Conference of the Parties has invited other international organisations including the FAO, WTO, WIPO and UPOV, to cooperate with its Ad Hoc Group on Access and Benefit-Sharing.*²⁶ *The CBD Secretariat and UPOV have corresponded for several years on “the process, nature, scope, elements and modalities of an international regime on access and benefit-sharing”.*²⁷ *This has taken the form of gaining information on the*

position of UPOV on work being done by the Ad Hoc Working Group.

- *The World Intellectual Property Organisation has shared information with other international organisations on issues of intellectual property and genetic resources including: A background document for the CBD's Conference of the Parties – Examination of Issues Regarding the Interrelation of Access to Genetic Resources and Disclosure Requirements in Intellectual Property Rights Applications;*²⁸ *a joint study with UNEP – The Role of Intellectual Property Rights in the Sharing of Benefits Arising from Use of Biological Resources and Associated Traditional Knowledge;*²⁹ *and Reports for the World Health Organisation in 2007 – Patent Issues Related to Influenza Viruses and their Genes and Draft Patent Landscape for the H5 Virus.*³⁰
- *WIPO's Intergovernmental Committee has also received guidance from the CBD's Conference of the Parties and the Commission on Genetic Resources for Food and Agriculture*³¹ *and WIPO has engaged with the CBD Secretariat, FAO, UNEP, UNESCO, WHO and WTO within its programme Intellectual Property and the Life Sciences,*³² *including a jointly organised symposium with FAO in 2008.*

The case study of genetic resources governance is useful for several reasons: it shows development of cooperative activities over a number of years as the focus of governance has expanded to incorporate new concerns; there are strong and controversial interactions between the issue of access to genetic resources and intellectual property rights; a broad and easily accessible base of genetic resources is vital to efforts to identify and adapt crops suitable for changing

climatic conditions; and there is an apparent divergence between the interests of developed and developing countries – the latter being the source of most of the world's key genetic resources and diversity, but not benefiting proportionately from their use.

6. Case study of cross-cutting governance – biofuels

In contrast to the previous case study, international governance of biofuels has only recently started to emerge. Several major industrialised countries/regional blocs – notably the US and EU – have adopted policies over the past few years to massively increase the production and consumption of biofuels in transport.³³ These policies were motivated by their perceived potential to reduced greenhouse gas (GHG) emissions, improve energy security, and boost agricultural and industrial development. However, the international effects of these policies have been largely detrimental.

The OECD (Organisation for Economic Cooperation and Development) has estimated that the \$11 billion per annum of subsidies for biofuel production and consumption made by the US, Canada and the EU will reduce greenhouse gas emissions by only 0.5-0.8%.³⁴ Documented land use changes, such as clearing rainforest for feedstock growth³⁵ are likely to result in significant additional emissions.³⁶ Increased demand for agricultural inputs (land, water, fertilizer, etc.), raises prices and limits the economic gains small-scale farmers can make from growing feedstock. In combination with this, diversion of land from food crop to feedstock production has contributed to recent substantial food price rises,³⁷ and is likely to remain a contributing factor into the medium term.³⁸ This affects the food security and development prospects of millions of people and is compounded by the effects of increased price

volatility as the linkages between food and fuel markets are strengthened.³⁹ Several other negative environmental and developmental impacts have been noted.⁴⁰

The dynamics outlined demonstrate that states cannot achieve internationally appropriate biofuel policies through individual action. The severe and in some cases irreversible impacts of biofuel mandates mean that policies for sustainable development of biofuels need a rapid international response, including the following actions:

- *Review of existing biofuel policies – particularly mandatory consumption/production targets;*
- *Extensive research and development on appropriate policy for sustainable production and consumption of biofuels;*
- *Establishment of sustainability criteria and assessment mechanisms;*
- *Analysis of the current regulatory situation – for example the implications of quality standards and certification schemes in relation to trade rules;*
- *Appropriate, consistent and complete assessments of biofuels, including life-cycle emissions, environment, development and energy security impacts;*
- *Policies that safeguard food security, for example by prioritising local food production needs; and*
- *Mechanisms for monitoring and review of implementation.*

The necessary integration of environment, development, trade, agriculture, food security, human rights and energy policies will require extensive coordination among international organisations with support from their member states and significant additional finance. The

organisations with an interest in the relevant policy areas include the:

- *Commission on Sustainable Development (CSD) – responsible for monitoring the implementation of international commitments on sustainable development;*
- *CBD Secretariat – concerned with the conservation and sustainable use of biodiversity;*
- *FAO – which has the mission to achieve food security for all;*
- *Office of the High Commissioner on Human Rights (OHCHR) – promotes and protects human rights internationally;*
- *United Nations Conference on Trade and Development (UNCTAD) – which has a “focus on ensuring that domestic policies and international action are mutually supportive in bringing about sustainable development”;*⁴¹
- *UNDP – provides advice and assistance to states on development issues;*
- *UN-Energy – the interagency mechanism for promotion of coherent policy on energy and sustainable development;*
- *UNEP – which leads international efforts on environment and development and includes the Intergovernmental Panel on Climate Change;*
- *United Nations Industrial Development Organisation (UNIDO) – which “promotes industrial development for poverty reduction, inclusive globalization and environmental sustainability”;*⁴²
- *World Bank – which provides technical and financial assistance to developing countries;*

- *World Food Programme (WFP) – responsible for the provision of food aid; and*
- *WTO – concerned with the reduction of tariff and unjustified non-tariff barriers to trade.*

6. 1. Cooperative initiatives

These organisations are aware of key issues raised by increased biofuels use – several have produced reports on the subject,⁴³ information sharing that may be viewed as a basic form of cooperative activity. The FAO took the lead in organising a High Level Conference on World Food Security: The Challenges of Climate and Bioenergy in 2008 – international organisations participating included the IPCC, OHCHR, UNCTAD, UNDP, UNEP, UNFCCC Secretariat, UNIDO, the World Bank, WFP and WTO. The UN Secretary-General established a High-Level Task Force on the Global Food Crisis in 2008. Its work includes development of an international consensus on biofuels. International organisations participating in the Task Force include, *inter alia*, the FAO, OHCHR, UNCTAD, UNEP, UNDP, WFP, WHO, World Bank, and WTO.

The FAO, UNCTAD, UNDP, UNEP, UNIDO and the World Bank also participate in the Global Bioenergy Partnership that works to develop a research base for sustainable development of biofuels. FAO seems to be most active in terms of ongoing work on biofuels – including through projects on Biofuels and Food Security (BEFS) and Biofuels and Food Security Criteria and Indicators (BEFSCI). The CBD Secretariat is also working on biofuels under its agricultural biodiversity programme – this includes an invitation to other international organisations for input on “information and experiences on the development and application of tools relevant to the sustainable production and use of biofuels”.⁴⁴

Extension / expansion of these cooperative activities will depend on the support of member states for such action, particularly the major states and regional blocs. Agreement between these groups is often difficult to achieve and therefore progress on these issues is likely to be slow. In regard to biofuels the *Declaration of the High-Level Conference on World Food Security*⁴⁵ only managed to agree that: in-depth studies should be carried out on sustainable production and use of biofuels; information should be exchanged “on biofuels technologies, norms and regulations”; and that further international dialogue is needed. While state support for specific international action on biofuels appears limited, policy reviews and amendments have taken place in the UK⁴⁶ and EU⁴⁷ in regard to concerns about environmental sustainability and effects on food prices. The US is also emphasising sustainability in its approach to biofuels.⁴⁸

7. Conclusion

Cooperation between international organisations is an increasingly important form of governance and is particularly relevant to addressing climate change issues which cut across the remit of several international organisations. This overlap provides the opportunity for cooperation. But international organisations also face several constraints when they attempt to cooperate. The most significant constraint is the attitudes of (particularly the powerful) member states. Their pursuit of short-term political and economic interests over long-term interests threatens to block effective attempts to address global challenges.

Acronyms

BEFS – Bioenergy and Food Security

BEFSCI – Bioenergy and Food Security Criteria and Indicators

CBD – Convention on Biodiversity

CSD – Commission on Sustainable Development
FAO – Food and Agriculture Organisation
GHG – Greenhouse gas
IGC – Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore
IPCC – Intergovernmental Panel on Climate Change
ITPGR – International Treaty on Plant Genetic Resources
OECD – Organisation for Economic Cooperation and Development
OHCHR – Office of the High Commissioner for Human Rights
TRIPS – Agreement on Trade Related Aspects of Intellectual Property Rights
UNCTAD – United Nations Conference on Trade and Development
UNDP – United Nations Development Programme
UNEP – United Nations Environment Programme
UNESCO – United Nations Educational, Scientific and Cultural Organisation
UNFCCC – United Nations Framework Convention on Climate Change
UNIDO – United Nations Industrial Development Organisation
UPOV – Union for the Protection of New Varieties of Plants
WFP – World Food Programme
WHO – World Health Organisation
WIPO – World Intellectual Property Organisation
WTO – World Trade Organisation

*Research Fellow in Science Ethics, Institute for Science, Ethics and Innovation, The University of Manchester.

¹ The term international organisation is used in this paper to refer to intergovernmental organisations with potentially universal membership (i.e. that are open to the

participation of any state). Regional or otherwise restricted membership organisations are not included in the analysis.

² For general reading on international organisations see, for example, Barnett, M. and Finnemore, M., 2004, *Rules for the World: International Organisations in Global Politics*, London: Cornell University Press; Goodspeed, S., 1987, *The Nature and Function of International Organisation*, 2nd Edition, Oxford: Oxford University Press.

³ This term includes voluntary standards, guidelines and codes as well as legally-binding treaties, agreed between states to govern their actions.

⁴ Rhodes, C., 2009, "Is the international regulation of biotechnology coherent?", *Journal of International Biotechnology Law*, Vol.6(5), pp.177-191.

⁵ Joyner, C., 2005, *International Law in the 21st Century: Rules for Global Governance*, Oxford: Rowman & Littlefield, p.7.

⁶ Rhodes, C., (forthcoming November 2010), *International Governance of Biotechnology: Needs, Problems and Potential*, London: Bloomsbury Academic, Chapter 11.

⁷ For further details see: UNFCCC, *Methodological Issues Relating to Hydrofluorocarbons and Perfluorocarbons*, http://unfccc.int/methods_and_science/other_methodological_issues/items/2311.php; UNFCCC, 2006, *Information on consideration by the Meeting of the Parties to the Montreal Protocol of the special report on safeguarding the ozone layer and the global climate system – Submission by the Ozone Secretariat*, <http://unfccc.int/resource/docs/2006/sbsta/eng/misc07.pdf>; and UNFCCC, 2010, *Summary of cooperative activities with United Nations entities and intergovernmental organizations to contribute to work under the Convention*, pp.9-10, <http://unfccc.int/resource/docs/2010/sbsta/eng/inf01.pdf>.

⁸ WHO, *Constitution of the World Health Organisation*, Article 70, adopted 1946, most recent amendments adopted 2005, <http://apps.who.int/gb/bd/PDF/bd47/EN/constitution-en.pdf>. (1946 version available through the Avalon Project: Documents in Law, History and Diplomacy – A Decade of American Foreign Policy 1941-1949, http://avalon.law.yale.edu/20th_century/decad051.asp.)

⁹ FAO, (no date given), *Constitution*, Article XIII, <http://www.fao.org/docrep/009/j8038e/j8038e00.htm>.

¹⁰ Sources include: the *WHO Constitution* (see footnote 8); *FAO Constitution* (see footnote 9);

WHO, 17.07.48 - 1, "Agreement between the Food and Agriculture Organisation of the United Nations and the World Health Organisation", pp. 54-57 in *Agreements with Other International Organizations*,

http://www.who.int/gb/bd/PDF/bd46/e-bd46_p4.pdf;

WHO, 16.12.04, "Agreement between the Office International des Epizooties and the World Health Organisation", pp. 77-80, in *Agreements with Other International Organizations*,

http://www.who.int/gb/bd/PDF/bd46/e-bd46_p4.pdf;

WHO, 17.07.48 - 2, "Agreement between the United Nations Educational, Scientific and Cultural Organisation and the World Health Organisation", pp. 58-61, in *Agreements with Other International Organizations*,

http://www.who.int/gb/bd/PDF/bd46/e-bd46_p4.pdf;

FAO, 2006, *Basic Texts of the Food and Agriculture Organisation of the United Nations*, Volumes I and II, 2006 Edition,

<http://www.fao.org/docrep/009/j8038e/j8038e00.htm>;

FAO, 1997, *International Plant Protection Convention*, https://www.ippc.int/file_uploaded/publications/13742.New_Revise_Text_of_the_International_Plant_Protection_Convention.pdf; and FAO, 2001, *International Treaty on Plant Genetic Resources*, http://www.planttreaty.org/texts_en.htm.

¹¹ The analysis in this section has been informed by discussions with staff of the FAO, WHO and WTO in March/April 2008.

¹² For further discussion of constraints see, for example: Goodspeed, S., 1987, *The Nature and Function of International Organisation*, 2nd Edition, Oxford: Oxford University Press; Dijkzeul, D. and Beigbedes, Y., 2003, *Rethinking International Organizations: Pathology and Promise*, Oxford: Berghahn Books; and Campbell, A.I.L., (April 1983), "The limits of the powers of international organizations", *International and Comparative Law Quarterly*, Vol. 32(2), pp. 523-533..

¹³ WHO, 17.07.48 - 1, "Agreement between the Food and Agriculture Organisation of the United Nations and the World Health Organisation", pp. 54-57 in *Agreements with Other International Organizations*,

http://www.who.int/gb/bd/PDF/bd46/e-bd46_p4.pdf.

¹⁴ In regard to structural constraints see, for example, Ruggie, J.G., 2003, "The United Nations and

Globalization: Patterns and Limits of Institutional Adaptation", pp.301-321 in *Global Governance 9*.

¹⁵ This point was particularly emphasised in discussions with staff of the FAO, WHO and WTO held in March/April 2008.

¹⁶ See, for example: Jinnah, S., Bushey, D., Munoz, M. and Kulovesi, K., 2009, "Tripping points: barriers and bargaining chips on the road to Copenhagen", *Environmental Research Letters* Vol.4(3), pp.2-6; and Johnson, T., 04.12.09, *Council for Foreign Relations Backgrounder – Copenhagen's Many Agendas*, http://www.cfr.org/publication/20906/copenhagens_many_agendas.html.

¹⁷ UNEP, 1992, *Convention on Biodiversity*, <http://www.cbd.int/convention/convention.shtml>.

¹⁸ WHO, 29.05.03, *Patent Applications for SARS Virus and Genes*, http://www.who.int/ethics/topics/sars_patents/en/print.html.

¹⁹ "By definition, a WHO collaborating centre is an institution designated by the Director-General of WHO to form part of an inter-institutional collaborative network set up by WHO in support of its programme at the country, intercountry, regional, interregional and global levels, as appropriate." http://www.who.int/collaboratingcentres/cc_historical/en/index1.html.

²⁰ WHO, 27.03.07, *Indonesia to Resume Sharing H5N1 avian influenza virus samples following a WHO meeting in Jakarta*, <http://www.who.int/mediacentre/news/releases/2007/pr09/en/index.html>.

²¹ WHO, 23.11.07, *Interim Statement of the Intergovernmental Meeting on Pandemic Influenza Preparedness: Sharing of Influenza Viruses and Access to Vaccines and Other Benefits*, http://www.who.int/gb/pip/pdf_files/IGM_PIP-IntStatement-en.pdf.

²² WHO, 18.05.09, *Pandemic Influenza Preparedness Framework for the Sharing of Influenza Viruses and Access to Vaccines and Other Benefits*, http://apps.who.int/gb/ebwha/pdf_files/A62/A62_5Add1-en.pdf.

²³ UNESCO, 1997, *Universal Declaration on the Human Genome and Human Rights*, <http://www.unesco.org/new/en/social-and-human>

[sciences/themes/bioethics/human-genome-and-human-rights/](#).

²⁴ Consultative Group for International Agricultural Research, (no date given), *Who We Are*, <http://www.cgiar.org/who/index.html>.

²⁵ See note 24.

²⁶ CBD Conference of the Parties, 2004, *Decision VII/19 – Access and Benefit-Sharing as related to Genetic Resources (Article 15)*, <http://www.cbd.int/decision/cop/?id=7756>.

²⁷ UPOV, 17.04.08, *Letter to the Executive Secretary of the Convention on Biodiversity*, http://www.upov.int/export/sites/upov/en/about/pdf/upo_v_cbd_17_04_2008.pdf.

²⁸ WIPO, 12.05.05, *Examination of Issues Relating to the Interrelation of Access to Genetic Resources and Disclosure Requirements in Intellectual Property Rights Applications*, http://www.wipo.int/meetings/en/doc_details.jsp?doc_id=44610.

²⁹ WIPO/UNEP, 2004, *The Role of Intellectual Property Rights in the Sharing of Benefits Arising from the Use of Biological Resources and Associated Traditional Knowledge*, http://www.wipo.int/tk/en/publications/769e_unep_tk.pdf.

³⁰ WIPO, 19.10.07, *Patent Issues Related to Influenza Viruses and Their Genes*, http://www.who.int/csr/disease/avian_influenza/WIPO_IP_20paper19_10_2007.pdf; WIPO, November 2007, *Patent Landscape for the H5 Virus: Interim Report*, http://www.who.int/csr/disease/influenza/avian_flu_landscape.pdf.

³¹ WIPO, no date -1, *Genetic Resources*, <http://www.wipo.int/tk/en/genetic>.

³² WIPO, no date -2, *Intellectual Property and the Life Sciences*, <http://www.wipo.int/patentscope/en/lifesciences>.

³³ See for example: European Community, 17.05.03, *Directive 2003/30/EC on the Promotion of the Use of Biofuels or Other Renewable Fuels for Transport*, accessed through EUR-LEX, <http://eur-lex.europa.eu>; US Government, 04.01.07, *Energy Independence and Security Act of 2007*, accessed through the Library of Congress THOMAS search facility, <http://thomas.loc.gov>.

³⁴ OECD, July 2008, *Economic Assessment of Biofuel Support Policies*, <http://www.sourceoecd.org/9789264049222>.

³⁵ Pearce, F., 19.04.07, "Biofuel plantations fuel strife in Uganda", *New Scientist*,

<http://www.newscientist.com/article/dn11671-biofuel-plantations-fuel-strife-in-uganda.html>; Koh, L.P. and Wilcove, D.S., 15.05.08, "Is oil palm agriculture really destroying tropical biodiversity", *Conservation Letters*, Vol.1(2), pp.60-64; and Kagolo, F., 19.01.10, "Hunger looms as biofuels take root in Uganda", *The New Vision*, <http://www.newvision.co.ug/PA/9/37/707552>.

³⁶ "Changes in land use, such as clearing tropical forests or using peatlands for the cultivation of crops, risk releasing enough greenhouse gases to negate any of the intended future climate benefits, as well as having major impacts on conservation of biodiverse habitats." The Royal Society, January 2008, *Sustainable Biofuels: Prospects and Challenges*, <http://royalsociety.org/displaypagedoc.asp?id=28632>, p.2.

³⁷ See, for example: IFPRI, *The World Food Situation: New Driving Forces and Required Actions*, Food Policy Report, December 2007, Washington D.C., <http://www.ifpri.org/pubs/fpr/pr18.asp>; OECD, 12.09.07, *Roundtable on Sustainable Development – Biofuels: Is the Cure Worse than the Disease?*, https://www.rsc.org/images/biofuels_tcm18-99586.pdf; and World Bank, July 2008, *Double Jeopardy: Responding to High Fuel and Food Prices*, <http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,contentMDK:21827681~pagePK:64257043~piPK:437376~theSitePK:4607,00.html>.

³⁸ "Current biofuel support measures are estimated to increase average wheat, maize and vegetable oil prices by about 5%, 7% and 19% respectively in the medium-term." p.10, OECD, July 2008, *Economic Assessment of Biofuel Support Policies*, <http://www.sourceoecd.org/9789264049222>.

³⁹ UN-Energy, April 2007, *Sustainable Bioenergy: A Framework for Decision Makers*, <http://esa.un.org/un-energy/pdf/susdev.Biofuels.FAO.pdf>, p.34.

⁴⁰ See, for example: The Royal Society, January 2008, *Sustainable Biofuels: Prospects and Challenges*, <http://royalsociety.org/displaypagedoc.asp?id=28632>; and OECD, 12.09.07, *Roundtable on Sustainable Development – Biofuels: Is the Cure Worse than the Disease?*, https://www.rsc.org/images/biofuels_tcm18-99586.pdf.

⁴¹ UNCTAD, *About UNCTAD*,

<http://www.unctad.org/Templates/Page.asp?intItemID=1530&lang=1>.

⁴² UNIDO, *UNIDO in Brief* ,

<http://www.unido.org/index.php?id=7840>.

⁴³ For example: FAO, 2008, *Bioenergy, Food Security and Sustainability: Towards an International Framework*, HLC/08/INF/3,

<ftp://ftp.fao.org/docrep/fao/meeting/013/k2498e.pdf>; UN-Energy, April 2007, *Sustainable Bioenergy: A Framework for Decision Makers*,

<http://esa.un.org/un-energy/pdf/susdev.Biofuels.FAO.pdf>;

and World Bank, July 2008, *Double Jeopardy: Responding to High Fuel and Food Prices*,

<http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,contentMDK:21827681~pagePK:64257043~piPK:437376~theSitePK:4607,00.html>.

⁴⁴ CBD Secretariat, 21.10.09, *Biofuels and Biodiversity: Additional Resources*,

<http://www.cbd.int/agro/biofuelresources>.

⁴⁵ FAO, 05.06.08, *Declaration of the High-Level Conference on World Food Security: The Challenges of Climate Change and Bioenergy*,

http://www.fao.org/fileadmin/user_upload/foodclimate/HLCdocs/declaration-E.pdf.

⁴⁶ UK Renewable Fuels Agency, July 2008, *The Gallagher Review of the Indirect Effects of Biofuel Production*,

<http://www.renewablefuelsagency.gov.uk/reportsandpublications/reviewoftheindirecteffectsofbiofuels>.

⁴⁷ EU, 23.04.09, *Directive 2009/28/EC on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC*

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32009L0028:EN:NOT>.

⁴⁸ See Biofuels Interagency Working Group, 03.02.10, *Growing America's Fuel: An Innovation Approach to Achieving the President's Biofuels Target*,

http://www.whitehouse.gov/sites/default/files/rss_viewer/growing_americas_fuels.PDF.

“Common but Differentiated Responsibilities and Respective Capabilities” as Part of the Post-2012 Climate Regime

*Ellen Margrethe Basse and Sanford E. Gaines**

The Copenhagen Accord confirms “common but differentiated responsibilities and respective capabilities” (CBDR) as a guide to action on climate change—based on different responsibilities for developed and developing countries. The article explains CBDR, then looks at instruments to facilitate technology development and transfer for renewable energy systems (RES), which in theory fits well with CBDR. The Kyoto Clean Development Mechanism (CDM) is consistent with CBDR but has not been effective enough to date. Changes to CDM such as multi-project “programs of action” may improve effectiveness. Nationally appropriate mitigation actions (NAMAs) commitments by developing countries and better monitoring of NAMAs may also spur RES technology diffusion. Proposed “sector carbon markets” (SCM) would strengthen incentives for RES technology even more, but because SCM involves emission reduction obligations it faces resistance from the same developing countries that complain generally about IPR barriers. Voluntary bilateral technology cooperation agreements may capture some of the technology diffusion benefits of an SCM program. But appeals to CBDR and avoidance of mitigation commitments by developing countries remain an obstacle to improved cooperation for transfer of RES and other climate-friendly technologies between developed and developing countries.

1. Introduction

The Bali Action Plan (BAP)¹ adopted at the 13th Conference of the Parties to the UN Framework Convention on Climate Change (COP13) in 2007 continues to guide the preparation of the post-2012 climate regime. It is now supplemented by the Copenhagen Accord,² the non-binding but “operational” roadmap for future work adopted

by the COP15, which begins as follows:

We underline that climate change is one of the greatest challenges of our time. We emphasise our strong political will to urgently combat climate change in accordance with the principle of common but differentiated responsibilities and respective capabilities.

The international community has thus reiterated that “common but differentiated responsibilities and respective capabilities” (CBDR) is a leading principle guiding future action on climate change.

CBDR has a long history in climate change policy, as well as in sustainable development and other areas of international environmental law. In this short paper, we briefly summarize the extensive legal literature on CBDR³ by way of background to those not deeply familiar with it. Our main purpose is to explore the implications of CBDR for the road ahead mapped out by the Copenhagen Accord, with particular reference to the themes of technology development and transfer and intellectual property rights at the center of the Regulating Global Concerns conference and this symposium issue. What regulatory frameworks and what legal instruments will facilitate appropriate technology development and transfer in accordance with the CBDR principle of the Copenhagen Accord?

2. Background on CBDR for climate change

Article 3.1 of the U.N. Framework Convention on Climate Change⁴ (hereinafter UNFCCC or the Convention) lays down as an operative guideline

that the effort of the Parties to “protect the climate system,” should be carried out “on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities”. Article 3.1 is the earliest articulation of CBDR in exactly those words,⁵ but the basic concept has a longer history in international environmental law, both before and after the UNFCCC. From that history we gain some understanding of its meaning and intended effect.

The UNFCCC was opened for signature in 1992 during the U.N. Conference on Environment and Development” (hereinafter UNCED) in Rio de Janeiro. UNCED strived to synthesize and integrate environment and development issues,⁶ working with the concept of sustainable development. Principle 7 of the Rio Declaration declares:

States shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity for the Earth’s ecosystem. In view of the different contribution to the global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit to sustainable development in the view of the pressure their societies place on the global environment and of the technologies and financial resources they command.

In Principle 7 we see the twin ideas of “common” responsibility and “differentiated” responsibility. The *common* responsibility is the obligation of all States to work in a spirit of “global partnership” in protecting and restoring the Earth’s ecosystems. But the responsibility is *differentiated* between developed and developing countries. The developed countries have a special “responsibility” in two respects: an implicit legal responsibility to others because of past and current acts, and an equitable responsibility to use their technical and financial capacity to alleviate the world’s environmental and

developmental problems.

Principle 7 has significant implications for sustainable development generally,⁷ and, as reflected in Article 3.1 of the UNFCCC, for climate change in particular. The consequences of the CBDR principle emerge in UNFCCC Article 4.2 - 4.8,⁸ where the developed countries commit themselves, for example, to “take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies and know-how to other Parties, particularly developing countries, to enable them to implement the provisions of the Convention”.

The antecedents of the equitable aspect of differentiated responsibility in Rio Principle 7 can be found in the 1972 Stockholm Declaration,⁹ where it is linked closely with the idea of “respective capabilities.” Stockholm Principle 23 declares as an essential consideration “the extent of the applicability of standards which are valid for the most advanced countries but which may be inappropriate and of unwarranted social cost for the developing countries.” Principle 12 reminds nations to “tak[e] into account the circumstances and particular requirements of developing countries” and suggests “the need for making available to them ... additional international technical and financial assistance” for the purpose of incorporating environmental safeguards into their development planning.

For climate change, the basic division between developed and developing countries, Kyoto Protocol Annex I and non-Annex I Parties, is based on classifying as “developed” all the members of the OECD as of 1992 along with the eastern European “economies in transition” at that time. After 20 years of economic changes, this categorization has become increasingly problematic. In the second decade of the 21st

century, some “developing” country economies have a higher per capita income than some countries still classified as “developed”.¹⁰

In its origins, CBDR expresses an expectation that developing countries have a responsibility to improve their environmental performance, but that they deserve special consideration in how that responsibility applies to them and special assistance in fulfilling it. Yet, comparing the soft tone of the Stockholm Declaration to rather more accusatory formulation of CBDR in the UNFCCC, it seems that earlier expressions of differentiation in the context of sustainable development have become infused with a stronger sense of assigning responsibility for past acts and making that responsibility the basis for a forward-looking obligation to remediate the environmental effect of those acts.¹¹ In particular, UNFCCC Article 3.1, in the sentence immediately following the statement of CBDR, goes on to say: “Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof”. That sentence has come to dominate international climate diplomacy on CBDR.

The UNFCCC COP1 in 1995 set the course for the Kyoto Protocol. The Berlin Mandate of COP1¹² reinforces the implication of CBDR that the developed countries have an obligation to be the first to mitigate. After a reference to the “right” of developing countries to sustainable development,¹³ the Mandate takes note of, “The fact that the largest share of historical and current global emissions of greenhouse gases has originated in developed countries, that the per capita emissions in developing countries are still relatively low and that the share of global emissions originating in developing countries will grow to meet their social and development needs”.¹⁴ Thus, in the climate change context, the developing countries were granted an essentially unconstrained opportunity to increase their own

emissions in the name of sustainable development. The Kyoto Protocol formally adopted this approach.

This understanding of CBDR was reinforced in the Plan of Implementation adopted at the U.N. World Summit on Sustainable Development, Johannesburg 2002. In that document, the CBDR principle of Rio Declaration Principle 7 is referred to eight separate times, with a special emphasis on poverty eradication as an indispensable requirement for sustainable development.¹⁵ Nearly 10 years later, these ideas remain the dominant frame of reference for CBDR in climate negotiations.

3. The Copenhagen accord

It is not surprising that the Copenhagen Accord reflects the particular development of the CBDR principle in the UNFCCC, the Berlin Mandate, and the Kyoto Protocol. Indeed, CBDR was further elaborated in the preparatory work for COP15 under the Bali Action Plan (BAP) – with its mandate to the two Ad Hoc Working Groups AWG-KP (Kyoto Track) and AWG-LCA (Long Term Cooperation Track). The BAP includes a long-term global goal for emission reductions to achieve the ultimate objective of the Convention in accordance with the principles of the Convention, in particular the CBDR principle, “taking into account social and economic conditions and other relevant factors”. Under the plan, the nationally appropriate mitigation actions (NAMAs) of developing countries are to be supported by technology transfer, capacity building and economic support. Furthermore, there is agreement for enhanced action on technology development and transfer to support action on mitigation and adaptation. The BAP preparatory work did not, however, lead to the hoped-for outcome of a definitive new agreement at COP15. Rather, twenty-odd leaders convened

by the Danish Prime Minister as “Friends of the Chair” drafted the “Copenhagen Accord” in the final 24 hours of the conference.¹⁶ The Accord was conceived as the foundation for a new and better process outside the chaos at COP15. The aim is a comprehensive political agreement that puts the parties on a clear path to concluding a legally binding post-2012 agreement. The Accord is, by its own terms, “operational immediately,” but it is not a legally binding document.

In its 12 paragraphs, the Copenhagen Accord has the ambition to establish the mechanisms, sources, and levels of support to be provided in a final agreement for mitigation, adaptation, capacity building, forestry and technology development and transfer. The influence of CBDR on the Accord is immediately obvious. In particular, the Accord reflects several levels of differentiation of responsibilities and capabilities that are already part of the fabric of the Kyoto regime. It is on this aspect of the Accord that we will focus.

As we noted at the beginning of this paper, Paragraph 1 of the Accord announces CBDR as a guiding principle, with a further commitment, “on the basis of equity and in the context of sustainable development, [to] enhance our long-term cooperative action to combat climate change”. It then recognizes the critical impact of climate change and the potential impacts of response measures on countries “*particularly vulnerable*” to its adverse effects, and a corresponding need for international support for a comprehensive adaptation program. Here we have recognition of a further differentiation, namely a differentiation among developing countries between the most vulnerable and others. This same differentiation appears elsewhere in the Accord.

Even while agreeing that “deep cuts in global emissions are required”, Paragraph 2 of the

Accord reinforces the well-established basic differentiation between developed and developing nations:

We should cooperate in achieving the peaking of global and national emission as soon as possible, recognizing that the time frame for peaking will be longer in developing countries and bearing in mind that social and economic development and poverty eradication are the first and overriding priorities of developing countries and that a low-emission development strategy is indispensable to sustainable development.

Similarly, Paragraph 4 of the Accord provides specific obligations for Annex 1 Parties:

Annex I Parties commit to implement individually or jointly the qualified economy-wide emission targets for 2020, to be submitted in the format given in Appendix I by Annex I Parties to the secretariat by 31 January 2010 for compilation in an INF document. Annex I Parties that are Party to the Kyoto Protocol will thereby further strengthen the emission reductions initiated by the Kyoto Protocol

This careful phrasing points to another differentiation, at least one in legal status. The United States is an Annex I Party to the UNFCCC, and so is included in the commitment to submit emission targets. It did so in a timely way as called for in Paragraph 4. The United States, however, is not a Party to the Kyoto Protocol and has, as is well known, not established a coherent national target for emission reductions, so its commitments will not “further strengthen” emission reductions.

Paragraph 5 of the Accord calls on Non-Annex I Parties to implement their own mitigation actions. The Non-Annex I parties are differentiated for this purpose into “*least developed countries and small island developing States*” (hereinafter LDCs and SIDS) on the one hand and other Non-Annex I parties (including the BASIC countries: Brazil, South Africa, India and China). For the LDCs and SIDS, action is voluntary and (financial) support is expected. Other developing

nations are “obligated” by the Accord to implement mitigation actions, and are to communicate their actions consistent with Article 12.1(b) of the UNFCCC. No specific mitigation actions are indicated, the chosen actions are not obligatory under the Kyoto Protocol, and the Accord neither links nor de-links compliance with the NAMAs to any level of financial support. Mitigation actions seeking support, however, must be identified and recorded in a registry, and supported mitigation measures are subject to reporting and verification. This language is presumably included to cover Clean Development Mechanism (CDM) activities, among others. If a binding solution on the post-2012 regime is based on the Accord, it will change the responsibilities of the BASIC-countries (and other emerging economies) compared to the current situation under the Kyoto Protocol.

Paragraph 3 of the Accord concerns adaptation, recognizing it as “a challenge faced by all countries”. Nevertheless, by giving special attention to the adaptation challenges for “those that are particularly vulnerable, especially least developed countries, small island developing States and Africa” it reflects a more or less well-established differentiation among developing countries. But note the calibration of differentiation between Paragraph 3 and Paragraph 5: Paragraph 5 (framing the conditions for NAMAs taken and envisaged by non-Annex I Parties) identifies LDCs and SIDS in general, whereas Paragraph 3 (on adaptation) adds “Africa” to its list of the “particularly vulnerable.” This presumably encompasses any African States that are not LDCs or SIDS; South Africa is one such nation that comes to mind. Finally, to be sure that there is no ambiguity about the basics of CBDR, Paragraph 3 ends with another obligation of developed countries—to “provide adequate, predictable and sustainable financial resources, technology and capacity-

building to support the implementation of adaptation action in developing countries.” But another implication of this final sentence is that no developing country, including any of the BASIC countries, is obligated to help the LDCs with adaptation.

The remaining paragraphs of the Accord are devoted almost entirely to matters of financial and other support to flow from developed countries to various categories of developing countries as part of the differentiated responsibility of the developed countries. Paragraph 6 on reducing emission from deforestation and forest degradation in developing countries (hereinafter REDD-plus) or similar activities, for example, does not differentiate recipient parties and their responsibilities, but focuses on “the mobilization of financial resources from developed countries”. Paragraph 7 (concerning the various approaches to be used in the climate policy) introduces another differentiation of parties: “low emitting economies” as a special class of developing countries. The *low emitting* developing economies are “especially” to be provided with incentives “to continue to develop on a low emission pathway.”

Paragraph 8 of the Accord details the “scaled up, new and additional, predictable and adequate funding as well as improved access” expected to be provided by developed countries. In the immediate future (2010-2012), developed countries commit to funding “approaching” US \$30 billion of new and additional resources for mitigation and adaptation, prioritized for use by the “most vulnerable”, meaning here the LDCs, SIDS and Africa. Further ahead, US \$100 billion is to be “mobilized” by 2020 from a mix of public and private sources. This further commitment is offered “in the context of meaningful mitigation actions and transparency on implementation” it

is not clear exactly what this means (mitigation and implementation by whom?) or whether the \$ 100 billion commitment is in some way contingent on progress on mitigation and transparency. Once again, it is notable that major emerging economies like China and Brazil are without any responsibility, in mitigation or financial contribution, with respect to solidarity in meeting the goals of the UNFCCC.

Finally, Paragraph 11 of the Accord has special relevance for the topic of this paper.

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.¹⁷

Interestingly, Paragraph 11 has no language about differentiating responsibilities. Technology development and transfer actions are to be based only on “national circumstances and priorities.” That language has suggestions of differentiation and certainly of “respective capabilities,” but it avoids broad classifications in favor of a case-by-case approach.

4. The regulatory framework for technology development and transfer as shaped by CBDR

Technology development and transfer of energy technologies, and specifically renewable energy technologies, can make a contribution to both mitigation and adaptation. Energy technology and the energy sector are not specifically mentioned in the Accord, but such issues are on top of the list in the negotiation process - together with deforestation, which is explicitly mentioned.

The CBDR principle as outlined above has had an important influence in shaping the Kyoto Protocol regulatory framework and the

adjustments to it being proposed under the BAP and the Copenhagen Accord for both the mitigation of climate change and adaptation to it.

With respect to mitigation, the most obvious effect of CBDR is in the differentiation between Annex I Parties and non-Annex I Parties, and this basic distinction is maintained in the Accord. Non-Annex I still have no mitigation obligations. They are to develop and commit to NAMAs, but their specific mitigation actions may be, and to date have always been, voluntary. For example, in its submission to the UNFCCC Secretariat in compliance with the Copenhagen Accord, Brazil “indicates” the NAMAs it will take, but explicitly observes that “the envisaged domestic actions as indicated are voluntary in nature.”¹⁸ Developing country NAMAs are often also framed expressly in terms of sustainable development and poverty eradication. So, for example, Brazil’s NAMAs emphasise reduction of deforestation, improvements in agricultural practices, and energy efficiency initiatives. Most developing countries also link their NAMA implementation to the compliance by Annex I Parties with their mitigation obligations, referring to Articles 3 and 4 of the UNFCCC.

Technology development, especially in the energy sector, is obviously a key element of climate mitigation undertakings by Annex I Parties. The EU, for example, is specifically committed to increases in renewable energy supply and energy efficiency as part of its mitigation program. Presumably, much of that technology will be transferable to developing countries, and there is the expectation that such transfer should take place. In the UNFCCC and Kyoto Protocol framework, the CDM is an important vehicle for such technology transfer. It is a specific expression of the CBDR principle, serving three vital goals of the climate regulatory regime. First, it helps the developing countries

that host CDM projects to make their own contribution to mitigation and it improves their long-term capacity to limit their own GHG emissions. Second, it provides a cost-effective means for Annex I Parties to meet their Kyoto emission reduction obligations. Third, it contributes to sustainable development by promoting the transfer of technology and financing from developed to developing countries, thereby contributing to environmentally sustainable economic development in the host country.

Adaptation has two dimensions: actions and financial support. For each dimension, we see in the UNFCCC, the Kyoto Protocol, and the Accord some further refinements of the CBDR principle. Most notably, for adaptation issues there is specific attention to the circumstances of the LDCs and those countries that are especially vulnerable to climate change – especially SIDS. The new element that the Accord introduces in this context is the additional specific reference, for some purposes, to Africa.

The actions or initiatives that may be appropriate for adaptation will be specific to each country, and also to certain groups of countries, consistent with CBDR. Effective adaptation depends, first of all, on the particular climate change effects that are anticipated for that country, to the extent that those can be identified. The situation of the SIDS is an obvious example, especially as compared with a landlocked country like Rwanda. Adaptation needs will also be determined by the environmental, economic and cultural circumstances of each country or region. The CBDR principle, as articulated most recently in the Accord, focuses special attention on the adaptation needs of those countries that are in some way more vulnerable to climate changes, including specifically the rather urgent threats to physical security facing the SIDS.

The other dimension of adaptation is providing the financial support to carry out those actions or initiatives. Developed countries are expected to self-finance their own adaptation measures. They are also expected to be the primary source of financial contributions to the adaptation needs of developing countries. With respect to technology transfer in the energy sector, the Accord reiterates the desirability of helping low-emitting developing countries develop their energy sectors along a low-emitting pathway. But the Accord glosses over one major issue with respect to financial support for adaptation: the degree to which the economically strongest among the developing countries should be allowed to benefit from developed country financial contributions. Indeed it might be asked at this time whether the richest developing countries should be donors rather than recipients of financial support. Perhaps the Green Climate Fund provided for in Paragraph 10 of the Accord can be the forum for resolving those questions. Paragraph 10 gives few details about this Fund, saying only that it will be an “operating entity” of the financial mechanisms of the UNFCCC and that it is established to “support”, among other objectives, “adaptation, capacity-building [and] technology development and transfer.”

5. The CBDR principle and the mix of instruments

Some important instruments of relevance for technology development and transfer being discussed are now being discussed internationally in the negotiations on the future of the climate regime leading to COP16 in 2010 and COP17 in 2011.

- *Technology cooperation focusing on the needs of specific sectors*¹⁹

- *Re-designed carbon markets linking innovation and modernization in the energy-intensive sectors*²⁰
- *CDM based on new standards for certification*
- *New multi-CDM-projects with standardized baselines based on Programmes of Activities (PoAs) covering a set of activities of the same type under a single umbrella*
- *Non-binding approaches (also called “no-lose targets”) – national or sectoral*
- *Sectoral crediting mechanisms (SCM)²¹ as mechanisms to grant credit for reducing emissions in a covered sector compared to the BAU scenario for that sector*
- *NAMAs by developing countries.*

The principal mitigation and adaptation technologies of interest with respect to technology transfer encompass energy generation, including renewable energy system (RES) technologies such as solar photovoltaics (PV panels) and wind power, and energy efficiency. In some respects, the emerging economies are already in a strong position in the energy sector. Wind turbine manufactures in China and India are in the top ten and the world's leading producers of PV panels are China and Taiwan.²² Consequently, one of the hot questions in the current negotiations on the future climate regime is whether the CBDR principle is relevant to technology transfer from the developed countries to the most advanced developing countries.

Many low-carbon projects in developing countries, mainly focused on RES and energy efficiency, can be financed by a new and better-designed CDM. The CDM has the advantage that it “directly links mitigation action with capacity building, technology transfer and financing.”²³ It

allows firms in developed countries to earn Certified Emission Reductions (CERs) as credit against their Kyoto emission reduction obligations through investment in emissions-avoiding projects implemented in developing countries. The CDM thereby ensures common but differentiated responsibilities between the parties involved: the developing country (the host country) avoids emissions and benefits from the transfer of technology, while the developed country (the donor country) can use the CERs from the project to offset some of its domestic GHG emissions. CDM is thus, in principle, a good example of technology transfer based on the CBDR principle.

Nevertheless, the implementation of the CDM has been criticized for various reasons. Due to its design as a project-based mechanism, the CDM does not often engage the host country in ways that would lead to structural changes and significantly influence energy system development.²⁴ Innovation and technological progress by a new CDM project in LDCs cannot be a mere reproduction of what is happening in the donor countries – innovations must be tailored to local opportunities, capabilities and needs.²⁵ Moreover, in practice the LDCs, and even many other developing countries, do not have the administrative systems and legal rules necessary to attract or receive the investments associated with CDM projects.²⁶ Another weakness connected to the current CDM design is the lack of credibility regarding their environmental integrity objectives. CERs are not necessary real and additional,²⁷ and the CDM has shown very little success in the area of end-use energy efficiency.²⁸

The CDM system will remain in force also after the end of the first Kyoto commitment period.²⁹ However, in the absence of internationally agreed quantitative reduction commitments, the interest

in new CDM projects will depend on national legislation. The mandatory European cap-and-trade system (EU ETS) established by a directive will accept CERs after 2012³⁰ – but with limitations to ensure that a large part of the EU emission reduction is done domestically.³¹ The EU's position on the post-2012 agreement is based on the essential concern for environmental integrity. An enhanced CDM in the post 2012-regime would require broader participation, including involvement of the US and the major emitters from the developing countries, commensurate with the Parties' responsibilities and capabilities.³²

One alternative to CDM, sectoral approaches and sector specific actions through SCM (a sector trading carbon market), is referred to in the BAP. Taking the UNFCCC Article 4, paragraph 1(c)³³ as the basis for its work, the AWG-LCA has developed proposals for cooperative sectoral approaches and sector-specific actions in order to enhance the implementation of paragraph 1(c).³⁴ The main objective of the SCM is to cover sectors that have a large reduction potential, sectors that are most exposed to carbon leakage, or sectors that significantly affect production costs of sectors exposed to carbon leakage.³⁵ The ambition is to stimulate the relevant developing country to continue its development in a less carbon-intensive direction and to reduce the problems related to leakage. Through the crediting target, it is possible for the country voluntary to reduce its emissions and gain financial support if it does better than the target. The reductions between the sectoral BAU emissions and the crediting threshold can be considered a mitigation contribution of the developing country resulting from the SCM.

With reference to the electricity sector, which makes a large and rapidly growing contribution to the total greenhouse gas (GHG) emissions

from developing countries, the SCM instrument is presented as one way of overcoming weaknesses of the current CDM and encouraging structural changes and significant reductions of CO₂ emissions in carbon-intensive sectors in developing countries.³⁶ The idea is to set a non-binding target below the emission level estimated for a BAU scenario on a national level. The target has to be decided on the basis of the national emission intensities of the relevant sector in the relevant developing country. It has been argued that respect for the CBDR principle can be ensured by a reframed SCM that only covers the energy sector.³⁷ Combining CBDR with meaningful participation in a global cap-and-trade system through sector targets for developing countries is one of the important and promising discussions on the future regime and future instruments.

There are two main differences between the CDM and SCM. The first is that the CDM typically applies to a single project, which is usually related to a single installation, whereas SCM would cover an entire sector. The second is that the CERs are additional to the emissions that would have occurred in the absence of the CDM-project, while the SCM would credit reductions against the targets agreed by the relevant developing countries.³⁸ That is, the development of SCM-based cap-and-trade systems is to take place at the national level following national design choices. The EU has proposed that the new SCM is an interim step towards the development of a more comprehensive multi-sectoral cap-and-trade system in developing countries.³⁹

The new SCM system has to be based on a difference, where the developed countries have to buy their allowances (an auctioning system) and the developing countries are granted a generous allocation, so that they can benefit from selling

the allowances.⁴⁰ An innovation/technology accelerator connected to such a system as part of the benchmarking system could thus be developed to reward companies that invest in technology that meets performance criteria and makes significant emission reductions or overachieves the benchmarks given those installations by giving them free allowances in addition to what could be expected from a normal implementation of benchmark rules. Redesigning of the market can also be related to setting stable prices⁴¹ or price signals⁴² to ensure the carbon market – such initiatives are not related to the CBDR.

Nevertheless, the discussion of sector and market-based regulatory instrument is a contentious matter because such instruments will bind the developing countries' industries, especially the industries in the emerging economies, to emission cuts. According to the World Business Council for Sustainable Development's Cement Sustainability Initiative, developing countries do not accept sectoral approaches because they fear that the systems will lead to back-door emission caps.⁴³ They argue that such obligations would be a violation of the CBDR-principle.

More positively, China sees the aim of voluntary cooperative sectoral approaches and sector-specific actions in the light of cooperation between parties at sectoral level as promoting the development, deployment and transfer of technologies. The CDBR principle is mentioned as one of the important principles supporting such technology cooperation focusing on the specific needs of specific sectors. Cooperation between inventors making it possible to advance technological progress is mandated by the CBDR principle.⁴⁴ Several parties have noted that the design of future instruments should be focused strictly on technology cooperation, addressing all

stages of the technology cycle and all technologies that control, reduce or prevent GHG emissions. Others stress the importance of such an approach as part of NAMAs. Furthermore, for developing countries this process of identifying and implementing sector-specific actions should be flexible and determined by their national capabilities and development goals.⁴⁵

Meanwhile, the NAMA pledges made by developing countries in response to the Copenhagen Accord in January 2010 are very diverse. Brazil is for example more explicit than China and Indonesia on the use of CDM (or SCM).⁴⁶ China has – with reference to Article 4.7 of the UNFCCC – pledged by use of voluntary measures to lower the carbon intensity of its GDP by 40% to 45% with respect to 2005 by 2020, and to increase the non-fossil share of primary energy consumption to 15%. It is unclear to what extent China sees the flexible mechanisms (such as CDM) as part of the instruments to achieve these objectives.⁴⁷ Brazil has pledged emission reductions of 36% to 38,9% with respect to BAU. The measures described in the notification are voluntary and will be implemented in accordance with Article 4, 10 and 12 (including references to financing and technology transfer from developed countries) of the UNFCCC.⁴⁸ India, which has pledged to reduce by 2020 the emission intensity of its GDP by 20-25% with respect to 2005 levels, also refers to the Articles in the UNFCCC that are based on the CBDR.⁴⁹ And South Africa has pledged a 34% reduction from its BAU trajectory by 2020 and 42% reduction below BAU by 2025.⁵⁰

The Copenhagen Accord, Article 5, ensures the first steps towards measurement, reporting and verification of these NAMA-based mitigation actions and GHG accounting of initiatives made by the developing country that are financially supported by UNFCCC financial mechanisms.

Financial support for technology development and transfer remains another important aspect of CBDR. The Accord, as mentioned above in Part 3, will be a guide for multilateral as well as bilateral technical assistance programmes. Such programmes can play a role in the transfer of technology by use of CDM and SCM projects.⁵¹ A significant part of the funds from the developed countries will come from the Copenhagen Green Climate Fund established by Article 10 of the Accord. It will support projects, programmes, policies and other activities in developing countries related to mitigation, including technology development and transfer not based on CDM or SCM projects.

6. Discussion of intellectual property rights

Intellectual property rights (IPR) have long been a tool to promote innovation and the dissemination of new ideas and inventions in developed countries. On the other hand, IPR can be a hindrance as well as a stimulus to technology transfer.⁵² The issue of protecting IPR is actually one of the most controversial in the discussion of the post-2012 regime. In the discussion, the broad scope or level of protection of IPR is seen by the developing countries as a barrier to their development. In the AWG-LCA, these countries stress the view that the protection of IPR acts as an impediment to the acquisition of new technologies and innovations in their countries, and consequently is not in harmony with the CBDR principle. Most developed countries, including the EU and the US, disagree with this assessment, and announced before the COP15 in December 2009 that IPR issues should not be on the agenda. IPR are, consequently, absent from the wording of the Copenhagen Accord.⁵³

The issue is not a simple as the political positions in the AWG-LCA make it out to be. It is predominately private companies in the

developed countries that retain IPR rights in various technologies. If a developing country is seeking to attract more financial support and promoting development, e.g. by taking part in CDM projects, it needs to solve many difficult problems related to investment climate, efficient governance, market size and infrastructure before dealing with the IPR issue. Strong IP protection creates in some situations a fundamental asymmetry between the donor country and the host country, with the result that for LDCs in particular the technology transfer might not stimulate local innovation and entrepreneurship.⁵⁴

Other observers point to non-IPR factors as being the real issues of economic importance for the future development of the developing countries. They argue that in many cases standard cost-benefit calculations about new investments or shortages of capital, not IPR questions, are the main impediments to adopting sustainable technologies such as energy efficiency improvements. For example, for the energy-intensive iron and steel industry, a comprehensive catalog of "best practices" and technologies for cost-saving energy efficiency improvements is publicly available on the Internet⁵⁵ - and not protected by IPR - yet the diffusion of these technologies is slow due to other factors.⁵⁶

As a way out of the conflict on the IPR issue some have suggested not to lessen the IPR protection as such but to grant free or low cost licenses on certain technologies for a set period to develop the LDCs.⁵⁷ The cost of access to technologies by developing countries could also be subsidized in specific circumstances, for example when overlapping patents on complementary components and inputs makes transaction costs very high. Such an approach has been presented by OECD.⁵⁸

To date, the polarized debate among governments about IPR and sustainable technologies continues. That debate, of course, is embedded within the larger climate policy debate in which CBDR is repeatedly invoked. So we end with a question: Are the constant references to CBDR in multiple contexts—mitigation, adaptation, technology transfer, financial support—becoming an obstacle to meaningful proposals and negotiations toward a post-2012 international climate framework?

From the documentary record, at least, it appears that the countries that could most benefit from technology transfer are also the ones that are consistently refusing, on CBDR principles, to accept any mitigation obligations. At the same time, these same countries are seeking IPR concessions from the Annex I Parties, who are shouldering the mitigation burden. Moreover, the lack of mitigation obligations by developing countries creates a gap in private market incentives for the installation of sustainable energy and other sustainable technologies. The one existing bridge across that gap, the CDM, has significant distributional problems, however, because the countries that could benefit most from project-based technology transfer are also the ones that are the least attractive to developed-country owners of transferable technology, especially technology covered by one or more IPRs. Sectoral initiatives such as SCMs are intended to work around these conflicts over CBDR, but they carry with them the risk, or the promise (depending on one's point of view) that developing countries will need to undertake some mitigation commitments to make these programs successful. To get to that point will require new legal modalities and, above all, new ways of constructing the meaning of the "common but differentiated responsibilities" of all members of the world community.

* Professor Ellen Margrethe Basse and Guest Professor Sanford E. Gaines, Aarhus School of Business and Social Science, Aarhus University, Denmark.

¹ Decision 1/CP.13 Bali Action Plan, doc. FCCC/CP/2007/6/Add.1*, December 15, 2007.

² UN Doc. FCCC/CP/2009/L.7, 18 December 2009. The Conference of the Parties "[took] note of" the Accord. Decision 2/CP.15, FCCC/CP/2009/11/Add. 1, 30 March 2010.

³ Useful analyses of CBDR with some linkage to climate change include: Christopher D. Stone, *Common but Differentiated Responsibilities in International Law*, 98 *American Journal of International Law* 276-301 (2004); Lavanya Rajamani, *The Principle of Common but Differentiated Responsibility and the Balance of Commitments under the Climate Regime*, 9(2) *RECIEL* 120-131 ((2000); Marie-Claire Cordonier Segger, Ashfaq Khalfan, Markus Gehring & Michelle Toering, *Prospects for Principles of International Sustainable Development Law after the WSSD: Common but Differentiated Responsibilities, Precaution and Participation*, 12(1) *RECIEL* 54-68 (2003); and Tuula Honkonen, *The Principle of Common but Differentiated Responsibility in Post-2012 Climate Negotiations*, 18(3) *RECIEL* 257-267 (2009).

⁴ Opened for signature 4 June, 1992; entered into force 21 March, 1994. Text available at http://unfccc.int/essential_background/convention/background/items/2853.php

⁵ Christopher D. Stone, note 3 above, at 276, 279.

⁶ John C. Dernbach, *Sustainable Development as a Framework for National Governance*, 49 *Case Western Reserve Law Review*, 1, 21 (1998).

⁷ Marie-Claire Cordonier Segger, "Sustainable Development in International Law" in Bugge & Voigt (eds.), *Sustainable Development in International and National Law*, Europa Law Publishing 87, 169-170 (2008); Tuula Kolari, "The Principle of Common but Differentiated Responsibilities as Contributing to Sustainable Development through Multilateral Environmental Agreements", *id.* at 251-267; Christina Voigt, "Climate Change and the Mandate of Sustainable Development: Observations from a Legal Perspective", *id.* at 547, 558-565; Philippe Sands, *Principles of International Environmental Law*, Cambridge (2. Edition), 2003, pp. 357-390 and Dernbach, *op cit.* note 6, at 14.

⁸ See David Freestone, *Introduction: The UN Framework Convention on Climate Change, the Kyoto Protocol and the Kyoto Mechanisms*, in David Freestone and Charlotte Streck (eds.), *Legal Aspects of Implementing the Kyoto Protocol Mechanisms; Making Kyoto Work*, at 5 (Oxford, 2005).

⁹ Declaration of the United Nations Conference on the Human Environment (Stockholm), 16 June 1972, A/CONF.151/26 (Vol. I).

¹⁰ Katia Karousakis, Bruno Guay and Cédric Philibert, *Differentiating Countries in Terms of Mitigation Commitments, Actions and Support*, OECD/IEA Doc. No. COM/ENV/EPOC/IEA/SLT(2008)2, at 15-17.

¹¹ Vito de Lucia, *Common but differentiated responsibility*, in *The Encyclopedia of Earth*, http://www.eoearth.org/article/Common_but_differentiated_responsibility; L. Rajamani, note 3 above, at 122-124.

¹² Decisions Adopted by the Conference of the Parties, Decision 1/CP.1, U.N. Doc. FCCC/CP/1995/7/Add.1.

¹³ *Id.* at Para. 1(c).

¹⁴ *Id.* at Para. 1(d).

¹⁵ Cordonier-Segger et al., note 3 above, at 57-58.

¹⁶ Note 2 above.

¹⁷ Concerning the challenges in relation to technology transfer, cf. Dominique Foray, *Technology Transfer in the TRIPS Age: The Need for New Types of Partnerships between the Least Developed and Most Advanced Economies* (International Centre for Trade and Sustainable Development, 2008), <http://ictsd.org/i/publications/50415/>.

¹⁸ Communication from the Government of Brazil to Yvo De Boer, 29 January 2010, available at http://unfccc.int/files/meetings/application/pdf/brazilcphaccord_app2.pdf.

¹⁹ See for example FCCC/AWGLCA/2008/CPR.4 of August 25, 2008, Report on the workshop on cooperative sectoral approaches and sector-specific actions, in order to enhance implementation of Article 4, paragraph 1(c) of the Convention. Most of the means are described in Ellen Margrethe "The future climate change regime for the COP15 agenda", in *Environmental Liability*, Lawtext Publishing, England, vol. 17, issue 2, s. 71-85 (2009).

²⁰ This can be established by setting a cap on emissions, see the Commission staff working document SEC(2010) 650/2

accompanying *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Analysis on options to move beyond 20% greenhouse gas emission reductions and assessing the risk of carbon leakage. Background information and analysis. Part II*, 2010, at 62.

²¹ Proposed by the EU, see *Stepping up international Climate Finance: A European Blueprint for the Copenhagen Deal*, COM(2009) 475 final and the Commission Staff Working Document accompanying the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee of the Regions, SEC(2009) 1172/2, September 2009; and Commission Staff Working Document SEC(2010) 650/2, note 20 above, at 8 and 12.

²² Commission Staff Working Document SEC(2010) 650/2, note 20 above, at 5.

²³ Karousakis et al., note 10 above, at 30.

²⁴ Wathanyu Amatayakul, Göran Berndes and Joergen Fenhann, *Electricity sector no-lose targets in developing countries for post-2012: Assessment of emissions reduction and reduction credits*, UNEP Risø CD4CDM Working Paper Series, no. 6, at 2 (2008).

²⁵ Dominique Foray, note 17 above, at 4.

²⁶ Damilola Olawuyi paper delivered at Regulating Global Change conference, Sandbjerg, Denmark, May 2010 (on file with the authors).

²⁷ Michael Wara, *Measuring the Clean Development Mechanism's Performance and Potential*, 55 UCLA L. Rev. 1759, 2008.

²⁸ The International Energy Agency, *Sectoral Approaches in Electricity – Building Bridges to a Safe Climate*, 15 (2009).

²⁹ The continuing use of CDM in the second commitment period is clear from the Decision 3/CMP.1 on Modalities and Procedures for a Clean Development Mechanism, see Commission Staff Working Document SEC(2010) 650/2, note 20 above, at 89. The second commitment period starts 1 January 2013.

³⁰ The EU ETS Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community and Article 5.2 of Decision No. 406/2009/EC adopted jointly by the European Parliament and the

Council on the effort of Member States to reduce their GHG emission to meet the Community's GHG reduction commitments up to 2020.

³¹ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *Towards a comprehensive climate change agreement in Copenhagen*, COM(2009) 39 final, at 11-12.

³² The European Council of 10-11 December 2009 concluded that as part of a global and comprehensive agreement for the period beyond 2012, the EU reiterates its conditional offer to move to a 30% reduction by 2020 compared to 1990 levels provided that other developed countries undertake to achieve compatible emission reductions and that the economically more advanced developing countries make a contribution commensurate with their respective responsibilities and capabilities, cf. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *International climate policy post-Copenhagen: Acting now to reinvigorate global action on climate change*, COM(2010) 86 final, at 2. See also the Commission Staff Working Document SEC(2010) 650/2, note 20 above, at 7-12.

³³ Article 4.1 (c) covers all stages of technology cycle: development, application, transfer and diffusion.

³⁴ See for example FCCC/AWGLCA/2008/CPR.4 of August 25, 2008, Report on the workshop on cooperative sectoral approaches and sector-specific actions, in order to enhance implementation of Article 4, paragraph 1(c) of the Convention.

³⁵ Commission Staff Working Document SEC(2009) 1172/2 accompanying the Communication from to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *Stepping up international climate finance: A European blueprint for the Copenhagen deal*, at 9.

³⁶ Amatayakul et al., note 24 above, at 2-3.

³⁷ Meriem Hamdi-Cherif, Céline Guivarch and Philipp Quirion, *Sectoral targets for developing countries: Combining "Common but differentiated responsibilities" with "Meaningful participation"*, Fondazione Eni Enrico Mattei, 2010.

³⁸ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions,

Towards a comprehensive climate change agreement in Copenhagen, COM(2009) 39 final, at 5-6; Commission Staff Working Document SEC(2009) 1172/2, note 35 above; Hamdi-Cherif et al., note 37 above.

³⁹ The Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *International climate policy post-Copenhagen: Acting now to reinvigorate global action on climate change*, COM(2010) 86 final, at 12.

⁴⁰ *Id.*

⁴¹ Stable prices would eliminate the basic incentive for speculation and make investments more attractive for the private investors.

⁴² Commission staff working document SEC(2010) 650/2, note 20 above, at 74-75 .

⁴³ ENDS Europe Daily, 5 November 2009.

⁴⁴ Estelle Derclaye, *Not only Innovation But Also Collaboration, Funding, Goodwill and Commitment: Which Role for Patent Laws in Post-Copenhagen Climate Action*, 9 John Marshall Review of Intellectual Property Law 161, 169-170 (2010).

⁴⁵ FCCC/AWGLCA/2008/CPR.4, note 19 above, at 2.

⁴⁶ Commission staff working document SEC(2010) 650/2, note 20 above, at 14-20.

⁴⁷ *Id.* at 14-16.

⁴⁸ *Id.* at 16-18.

⁴⁹ *Id.* at 18-19.

⁵⁰ South Africa, letter to Yvo de Boer, 29 January 2010, http://unfccc.int/files/meetings/application/pdf/southafrica_phaccord_app2.pdf.

⁵¹ Article 3 (financial support to adaptation) and Article 8 (financial support to mitigation) as well as Article 11 (the Technology Mechanisms) are based on the CBDR principle ensuring economic support from developed to developing countries.

⁵² Foray, note 17 above.

⁵³ Derclaye, note 44 above, at 161.

⁵⁴ Foray, note 17 above, at 32-36.

⁵⁵

<http://www.asiapacificpartnership.org/pdf/Projects/Steel/>

[SOACT-1-7-08.pdf](#). The handbook at that link was funded by the US government as part of the “Asia Pacific Partnership.”

⁵⁶ InterAcademy Council, *Lighting the Way: Toward a Sustainable Energy Future* 28-30 (2007), available at <http://www.interacademycouncil.net/Object.File/Master/12/063/2.%20Energy%20Demand%20and%20Efficiency.pdf>

⁵⁷ Derclaye, note 44 above, at 170.

⁵⁸ Mario Amano, *Policies to Tackle Climate Change and Promote Green Growth*, keynote address by deputy secretary general, OECD, to UNESCO Future Forum, 26 Oct. 2009, available at http://portal.unesco.org/en/ev.php-URL_ID=46786&URL_DO=DO_TOPIC&URL_SECTION=201.html.

Global Concerns and Renewable Energy Policies: The Use of Regional Vegetal Resources to Create Growth Zones in Developing Countries

Fernando do Rego Barros Filho

In a legal framework that must respect the ecologic balance, the economic viability, social inclusion and culture preservation, this study focuses on the efficiency of the Brazilian National Program of Biodiesel. The context shown below is the program's capability of developing isolated regions of the country characterized by lack of conventional energy policies, rich culture aspects, poverty and the possibility of producing energy by its natural resources and species. The results demonstrate a large legal framework already constructed and quantifiable evolution in regional fuel production, although the confusing legal system and the still poor economic incentives diminish the efficiency of the program.

1. Introduction

The substitution of the current world's energy model, based in fossil fuel, is a global issue. Law, as a social life organizer, has an instrumental function in these policies' materializing, which must observe the regional factors to develop local green energy production and its population. As an example the biodiesel fuel can be extracted from various natural vegetal sources, found in various poor regions of Brazil. The agricultural background is ready to be used, which decreases the gap between the energy technology status of developed and developing countries.

By this scenario, using the legal structure of the Brazilian program of biodiesel use and production, the possibility and viability of local renewable resources to develop its host regions will be analyzed. Charts of the national biodiesel production and its geographical distribution can assure a critical analysis of the juridical categories

used as the possible instruments that can be executed to improve the process.

2. Instruments of analysis

2.1. A perspective of sustainable development

The concept of a *sustainable development* cannot be seen as a balance between economic activity and natural resources available, because it does not consider the social and cultural balance of the involved populations in the resource management. In this order, a real concept of *sustainable development* must follow these contents: a) ecological balance; b) social inclusion and cultural maintenance; c) economic viability.¹

Ecological balance means a real view of the resources needed and wasted as well as the environment's physical, biological and chemical capacity of sustaining the demands of the production system. It cannot be confused with the technologic capacity of avoiding the excess of pollution or any future prognostic of this scenario. The adapting movement of the production system towards a cleaner production involves not only the technology available, but also costs of installation, entrepreneurial/consumer behavior and regional geopolitics.

The social inclusion and cultural protection reveals the need of comprehension of the different social structures living in the society and the conscience to study and protect them. The capitalistic model of the last century, based on the monoculture crops and maximum

productivity, exterminated entire local social structures in the developing countries, reducing its populations to poverty and cultural misidentification in urban centers.² In this context, the main objective is to absorb these communities to the production system, provide them economic survival and sustain their cultural background.

The economical viability of the development model resides in its efficiency to allocate natural, social and cultural resources in the most harmonic way possible with adequate satisfaction of human needs. Must be noted that the economy survival depends on the economic agents' behavior, production adaptation (e.g. alternative fuel use), redirection of the economical activity priorities and consuming patterns. All these factors must converge to internalize the negative externalities caused by the economical activities and make the economic system possible.

In this scenario, the research made proposes an economic study of the legal system directed to the biodiesel production and its capacity to develop even the most isolated regions of the country.³ That implicates verifying the efficiency of these norms to promote a better planned energy allocation, environmental sustainability and social/cultural protection of the population. Efficiency is determined by Schäfer as maximizing the allocation of natural resources and ensuring quality of life.⁴ The studied environmental regulation, thus, will be efficient while guaranteeing the best allocation possible of the natural resources.⁵

The arguments above show the necessity for the legal system to adopt certain guidelines:⁶ a) the use of the market as the State's auxiliary in the natural resources management; b) possibility of transfer of natural resources to those who most need them, done with the proper compensation; c) unity of the information system of resource

management to ensure the best logistics; d) guarantee of life quality for the population. These items do not aim to substitute the state regulation, but to avoid its structural super dimensioning, maintenance cost increase and lack of efficiency...

3. The Brazilian policy on biodiesel use

3.1. Guidelines for a public energy policy

The Brazilian Law No. 11.097/2005 represented the normative framework for regulation of *biodiesel* in Brazil. It changed the art. 1^o of Brazilian Law No. 9.478/1997, determining biofuels development as one of the energy policies guidelines.⁷ Another important factor is the intensity of fossil diesel replacement rule. It determines the volume of at least 5% of *biodiesel* in the composition of the total common diesel sold to consumers in the national territory by the year of 2013 (Art. 2^o, § 1).

An exception to this transition mechanism can be found in Art. 2^o, § 2 of Law 11.097/2005. It established that the National Energy Policy Council could decide for the decrease of this period of transition and establish new criteria.⁸ Such information is important, when you observe the recent edition of Resolution No. 06/2009 of CNPE, which raised the minimum percentage of *biodiesel* blend with the fossil diesel to 5% in January/2010 and accomplished the objectives previewed for 2013.

3.2. Standards for social inclusion

The system presents the concern of developing the poorest regions of the country by offering specifically designated incentives. Law No. 11.097/2005, for example, states that the minimum amount of mixture of biodiesel with the diesel common will have to be processed, preferably, from raw materials produced by

family farmers, including those resulting from collecting activity (art. 2º, § 4).

Public authorities can determine different rates of economical incentives, depending on the raw material used in the production of biodiesel, its geographical origin and the producer involved (art. 5 of Law No. 11.116/2005). Beside this mechanism, there is an economic incentive for producers of biodiesel offered by the so-called *Social Fuel Seal* (Art. 7, MDA Resolution No. 01/2005). This seal reveals some special financial conditions for the biodiesel producers. The resolution 1135/2004 of the Brazilian National Bank of Development (BNDES) provides funding of up to 90% of the total cost of the projects directed to the production of biodiesel. If the producer of biodiesel does not have the seal, this percentage drops to 80% of the total project cost of the production project.

3.3. Specific tax incentives

Federal law provides tax incentives to both biodiesel and raw material producers. There is no Industrialized Product Tax (IPI) to the product biodiesel.⁹ In addition, the national tax system allows the reduction (and even the exemption) of social contributions (Art. 4º of Decree No. 5.297/2004). In the latter case, it should be noted that the format of incentives varies depending on raw materials and producing region, which shows the mechanism seen in art. 5º of Brazilian Law No. 11.116/2005.

4. Regional factors to promote growth zones by renewable energy policies

4.1. Geographical areas of analysis

The Northern and Northeastern Brazil¹⁰ contains the major part of the communities with no connection to an electric supplier, and no solution was efficient in dealing with it. The conventional Brazilian energy model based on connections to

central electric stations in the major urban locations does not apply to some areas in these regions. These communities are largely spread on the territory, even days of non-road travel for any city. Besides, these places use diesel generators, whose cost is very high, due to the large distance of fuel transport.

These communities have their own social structure and way of life, which makes these regions very rich anthropologically. Their relation with the surrounding environment brings attention: their traditions accumulated hundreds of years of knowledge towards species cultivation. However, the lack of financial resources to acquire the minimum living standards despairs these communities. The youngest people become uninterested in the continuity of their traditions and leave the communities to the poorest zones of the huge urban centers due to the lack of qualification for the labor market.

By the facts shown above, it is possible to denote the following characteristics: a) isolation from the major Brazilian centers; b) presence of traditional communities linked to the region; c) large quantity of biodiversity and directed knowledge; d) precarious condition of life; e) cultural degeneration.

4.2. The use of regional vegetal species to produce energy in remote regions

Brazilian law defines *biodiesel* as a fuel made from renewable biomass destined to internal combustion engine use, which can substitute partially or entirely fossil originated fuel.¹¹ The most important: it can be extracted by a numerous range of economically viable vegetal species,¹² which were related in the primary inter-ministerial study made by the Brazilian government:¹³

Efficiency in oil of vegetal resources

SPECIE	EFFICIENCY IN OIL
Cotton	30 a 40%
Peanuts	40 a 50%
Rice	15 a 23%
Babaçu	58 a 67%
Coconut	50 a 65%
Rape seed	39 a 45%
Sesame	48 a 55%
Sunflower	45 a 55%
Linseed	35 a 45%
Mamona	45 a 55%
Corn	30 a 36%
Coconut Palm	35 a 45%
Palmiste	55 a 65%
Soybean	18 a 21%

Although there are some vegetal species more efficient to produce *biodiesel*, soybean appeared as the major raw material supply. Materials like mamona and babaçu, for example, have neither scale production nor detailed database to face possible production problems. As soybean is the largest crop commercially available,¹⁴ it became the main source of biodiesel production.

A simple geographical analysis indicates the impossibility of this model of biodiesel production. The forest presence eliminates any possibility to hold a commercial soybean crop, and they do not need it. Most of them are covered by native useful species that can produce biodiesel not only for its demands, but commercially. There are several programs that promote pilot power stations and fuel plants in over 30 communities across the Amazon region.¹⁵

The advantages of the use of this energy model for the regions mentioned are huge. The receipt generation by fuel production stimulates the local population to not destroy the surrounding biological resources. Socially, the community

integrates with the production system without degenerating itself, as it can be economically sustainable and can acquire basic human needs and services. In this context, the cultural background is protected and guaranteed by the continuing strength of the renewed ties of its inhabitants.

5. Viability analysis

By the perspective of sustainable development shown in the item 2.1, the energy program must improve in some sectors to achieve its maximum efficiency. Here are some examples:

5.1. Confusing legal framework

The minimum cost of transaction requires a clear range of property right rules, and a direct system of governmental competences to solve the environmental licensing conflicts. The governmental competences, as well, must be clear and functional, what decreases bureaucratic time and production delays.

Although the Brazilian legal system presents several incentives to the fuel productions in the zones defined above, it presents some practical and structural problems. In the practical area, most of the land does not have a defined property title or an adequately defined land use system. There are two types of problems: a) nobody knows exactly whose land is being used, due to the lack of precise mapping and land registering; b) the land is eligible as an extractive *reserve*,¹⁶ but there is no specific regulation to protect the area and its use for product collection.¹⁷

The structural problems are observed in the administrative spheres of competence given by the Brazilian Constitution.¹⁸ The constant struggle to define which bureaucratic environmental sector would police the private agent's projects dramatically slows down the environmental

licensing and monitoring processes. This scenario, then, creates an inconvenient distance between the private agent's financial resources and the energy projects, because there is a lack of confidence about the definition of the real costs of operation of the whole energy project.

5.2. The lack of a united information system

One of the keys to an economically efficient juridical order is a clear system of environmental information. The local institutions must provide all the produced information to a central database of environmental information, which would decrease the transaction costs of evaluating where the available resources for the population use are. Not only centralized information is needed, but an easy process to access the governmental database is also important to direct the private agents towards the best investment.¹⁹ These two factors show the importance of the environmental information system: availability and possibility of exploitation.

Although the SISNAMA²⁰ provides some database about the environmental assets and its possibilities of private exploitation,²¹ which represents a great evolution, there is still much work to be done. The systemic conflicts between the environmental institutions affect the information system and its viability. There are just a few and still timid initiatives to unite their information and action systems, which increases the transaction costs, especially in bigger projects.²² For example, these problems avoid the CDM- projects (Clean Development Mechanism) as well. The absence of a unified and reliable system of available resources reduces the possibilities of creating new projects and reduces the amount of carbon credits launched into the market.

5.3. Low effect of the given incentives

As shown in the third part, the specific Biodiesel Program Law indicates a series of tax and financial incentives for the private agent to produce in the Northern and Northeastern regions. There is even a mechanism of increasing/decreasing these incentives depending on the region where the plant is located and the type of vegetal source used. It is possible, then, to control and manage the benefits and incentives for the private agents to realize energy projects in the most distant regions of Brazil, consolidating new manners of biodiesel production and its diversification, given the soybean dominance.

Actually, the biodiesel production charts do not demonstrate much advance, as it indicates the continuing predominance of soybean and the lack of increase of alternate vegetal sources in the energetic matrix.²³ In the specific regions treated in this work, the increase of cost caused by natural geographical difficulties of transportation almost extinguishes the private interest in investing in these regions.²⁴ The amount of incentives given by the juridical instruments is not sufficient to overthrow the logistic difficulties of producing in distant areas.

The management of the economic incentives must observe two factors in this scenario. The first of them is related to the accountability of the difficulties shown above. They must be quantified and equalized into financial incentives that allow the private agents to invest and prosper. The second one is the limit of these incentives. If the economic costs exceed the benefits brought by their adoption, they are not viable.²⁵ The statistical control is a key factor to a correct analysis: the initiatives/projects must quantify and qualify not only the economic benefits, but also the ecological, social and cultural indexes, as explained in the item 2.1.

6. Conclusions

Some regions in Brazil do not adapt to the hegemonic energy public policy. The distance to the huge city centers, the costs of the energy links and its land configuration forbid the implement of the agricultural model seen in major land properties. The energy policies originated in native vegetal sources of biodiesel represent an alternative way of development of these communities: a) it sustains the local forest; b) provides resources for the communities; c) reduces poverty and the need of moving from the locality; d) sustains the linkage and the empiric knowledge about the species; and e) reduces the technological gap by means of the natural knowledge already dispersed in the communities.

Brazil already has an entire legal framework to stimulate these efforts. The legal framework determines economic and social stimuli to provide development in areas covered by the biodiesel producing species. There are some initiatives to unify all the environmental database, such as the existing conservation units and resources available in the country, as juridical and economic incentives to direct the investment traffic to the poorest areas of the country. The system, however, is not perfect yet. The conflicts presented in the legal framework and the environmental authorities competence conflicts still increases the social cost of investing. Besides that, the economic incentives are still insufficient to provide a massive flow of investments and even surpass the huge costs of producing energy in isolated Brazilian regions.

7. References

- AGÊNCIA ESTADO. *Petrobras investe em produção de biodiesel no Pará*. Available at <http://portalexame.abril.com.br/negocios/noticias/petrobras-investe-producao-biodiesel-556171.html>. Access in 06/14/10;
- BRASIL. ANP (National Petroleum Agency). *Monthly Biodiesel production report*. Available at <http://tinyurl.com/22rkyu2>. Access in 06/04/2010;
- BRASIL. EMBRAPA. *Soybean in numbers*. http://www.cnpso.embrapa.br/index.php?cod_pa_i=16&op_page=294, Access in 03/01/2009;
- BRASIL. MMA. CNUC (National conservation units registry). Available at <http://www.mma.gov.br/sitio/index.php?ido=sistemaInformacao.index>. Access in 06/02/2010;
- BRASIL. Regional Integration Ministry. *Plano Amazônia Sustentável*. <http://www.integracao.gov.br/pdf/desenvolvimentoregional/pas.zip>, Access in 03/01/2009;
- BRASIL. SÃO PAULO. University of São Paulo. *Atlas of the Brazilian bioenergy*. Available at http://cenbio.iee.usp.br/download/atlas_cenbio.pdf. Access in 01/09/2010;
- BREYER, Stephen. *Regulation and its reform*. EUA: Harvard Press University, 1982;
- COOTER, Robert; ULEN, Thomas. *Law and Economics*. 3^a ed. EUA: Longman, 2000;
- FRIEDMAN, David D. *Law's Order. What Economics Has To Do with Law and Why It Matters*. Princeton: Princeton University Press, 2000;
- LEFF, Enrique. *Epistemologia ambiental*. Translated to Portuguese by Sandra Valenzuela; reviewed by Paulo Freire Vieira. 4^a ed. rev. São Paulo: Cortez, 2007;

MICELI, Thomas J. *The economic approach to law*. EUA: Stanford University Press, 2004;

MORIN, Edgar. *Terre-Patrie / Edgar Morin and Anne-Brigitte Kern. Translated from french by Paulo Azevedo Neves da Silva*. Éditions du Seuil, 2005;

SCHÄFER, Hans Bernd; OTT, Claus. *The economic analysis of civil law*. Northampton: Edward Elgar Publishing, 2004.

* Lawyer, analyst at the Paraná State Accountability Office, Master student of Environment Law and Development at Federal University of Paraná, Brazil. Email Address: fernando@fernandobarros.adv.br.

¹ LEFF points that the environmental rationality is not based on productivity or efficiency, as seen in the economic theories but on ecological balance and social/cultural inclusion and maintenance. These factors must be joined to the economic system to modify its priorities and objectives. LEFF, Enrique. *Epistemologia ambiental*. Translated to Portuguese by Sandra Valenzuela; reviewed by Paulo Freire Vieira. 4^a ed. rev. São Paulo: Cortez, 2007. p. 135-136.

² MORIN, Edgar. *Terre-Patrie / Edgar Morin and Anne-Brigitte Kern. Translated from French by Paulo Azevedo Neves da Silva*. Éditions du Seuil, 1995. p. 61.

³ The economic analysis of the law represents the norm study by a economic perspective, which the most perceptible effect is the conception of the Law as a determinant of behavior and instrument for public policies materializing. COOTER, Robert; ULEN, Thomas. *Law and Economics*. 3^a ed. EUA: Longman, 2000, p. 7.

⁴ COOTER; ULEN. Op. Cit., p. 8.

⁵ COOTER (n. 6) p. 9.

⁶ Although the guidelines are directed to correct negative externalities caused by environmental damages, it can be useful for the energy production system, as we still have a whole market of forestry areas that needs protection and private agents who need to invest in these areas to collect its productive species. MICELI, Thomas J. *The economic approach to law*. EUA: Stanford University Press, 2004. p. 11.

⁷ Art. 1^o, XII, Lei n^o 8.478/1997.

⁸ The criteria are: a) availability of supply of raw materials and industrial capacity to produce *biodiesel* b) the participation of family farming in the supply of raw material, c) reducing the regional inequalities d) the performance of engines with the use of fuel, industrial policies and technological innovation.

⁹ The last table of taxed products by this contribution (annex of the Brazilian Decree No. 6.006/2006) excludes *biodiesel* from taxation.

¹⁰ The Northern region includes the states of Acre (AC), Rondônia (RO), Amazonas (AM), Roraima (RR), Pará (PA), Amapá (AP) e Tocantins (TO). The Northeastern region includes the states of Bahia (BA), Alagoas (AL), Sergipe (SE), Pernambuco (PE), Paraíba (PB), Rio Grande do Norte (RN), Ceará (CE), Piauí (PI) and Maranhão (MA).

¹¹ Art. 6^o, XXV, Brazilian National Law n.º 9.478/1997.

¹² Actually, *biodiesel* is extracted from vegetal oil and even animal oil. Nonetheless, the latter initiative is really rare and isolated.

¹³ BRASIL. Regional Integration Ministry. *Plano Amazônia Sustentável*. <http://www.integracao.gov.br/pdf/desenvolvimentoregional/pas.zip>, Access in 03/01/2009.

¹⁴ Recent numbers point at Brazil as the second producer in the World with 58,4 millions of tons, according to the Brazilian national authorities. BRASIL. EMBRAPA. *Soybean in numbers*. http://www.cnpso.embrapa.br/index.php?cod_pai=16&op_page=294. Access in 03/01/2009. Represents 83% of the raw material used to produce *biodiesel*, according to the latest monthly review of the Brazilian Petroleum Agency. BRASIL. ANP. Monthly *biodiesel* production report (May 2010). Available at <http://www.anp.gov.br/?dw=25747>. Access in 06/04/2010.

¹⁵ The Biomass Reference Center of Biomass from the University of São Paulo provides detailed information about the running programs and its production. BRASIL. SÃO PAULO. University of São Paulo. Atlas of the Brazilian bioenergy. Available at http://cenbio.iee.usp.br/download/atlas_cenbio.pdf. Access in 01/09/2010.

¹⁶ Brazilian Law No. 9.985/00 determines a legal framework for environmentally protected areas: the *conservation units*. It classifies these areas by their ecologic

importance and limits economical intervention in several ways (third chapter). For example, some areas cannot be exploited economically; others adopt the monitored forestry products collection system. The last ones are characteristic of the Extractive Reserves (art. 18), whose objectives are exactly the protection of the collective communities that live in the ecologic preserved area and its cultural background. To guarantee the accomplishment of those objectives, the reserve must have a deliberating council, formed by representants of public institutions and from the local communities, and an exploitation plan, which determines how the land can be used.

¹⁷ This problem may appear in two perspectives. The first one is the lack of a legal act to create the extractive reserve and its borders, leaving the area's population in an insecure context. The second one is related to the lack of efficiency of the reserve's council to determine an exploitation plan for the forestry product collection, due to its absence or politic interests of its participants.

¹⁸ The Brazilian State has three instances of administrative competence: the Federal Union, The Estates and the Municipalities. Each of them has environmental competences given by the national Constitution (art. 24, art. 30, I), and complements each other. The borders of these competences have caused a large quantity of jurisdictional conflicts, which increases the transaction costs for all new projects.

¹⁹ Internet database services available for public consulting, as a fast bureaucratic response for the public questions are measures to ensure an adequate information access.

²⁰ Abbreviation for *Sistema Nacional do Meio Ambiente*. Created by the Brazilian Law No. 6.938/81, represents the nation system of environmental information and protection.

²¹ The Brazilian Environmental Ministry has a database of all allowed *conservation units* in the country, even the ones held by the States and the Municipalities. BRASIL. MMA. CNUC (National conservation units registry). Available at <http://www.mma.gov.br/sitio/index.php?ido=sistemaInforacao.index>. Access in 06/02/2010.

²² In huge and harmful projects, the appearance of two or more environmental institutions claiming their competence over the environmental licensing and monitoring are common. Due to the confusing legal

framework, there are numberless jurisdictional conflicts on this matter. On the other hand, smaller projects sometimes have no institutional claim of competence.

²³ A comparison of graphics of the last five years shows almost no increase of other vegetal sources in the biodiesel production matrix. BRASIL. ANP. Monthly biodiesel production report. Available at <http://tinyurl.com/22rkyu2>. Access in 06/04/2010.

²⁴ Some initiatives are still being held in the region, such as the PETROBRAS investments in palm oil production in far regions of Pará (PA). AGÊNCIA ESTADO. *Petrobras investe em produção de biodiesel no Pará*. Available at <http://portalexame.abril.com.br/negocios/noticias/petrobras-investe-producao-biodiesel-556171.html>. Access in 06/14/10.

²⁵ BREYER determines that the regulation or public policy must observe its cost of implementation and the benefits brought to the population. In other words, how much the population is willing to pay for the ecologic benefits?. BREYER. *Regulation and its reform*. EUA: Harvard Press University, 1982, p. 23.

DAY 1: Coping with global issues in a global context: The legal toolbox of today for addressing climate change

Professor Thomas Cottier, University of Bern, Managing Director, World Trade Institute
Director, Institute of European and International Economic Law: **After COP 15: Where do we go from here?**

Professor Hans Christian Bugge, University of Oslo: **The international climate regime: Between ecology, equity and efficiency.**

Professor Han Somsen & Associate Professor Morag Goodwin, University of Tilburg: **Regulating for technology transfer in developing countries in the context of climate change: an appropriate legal toolbox.**

Professor Ilona Cheyne, Oxford Brookes University: **Intellectual property and climate change from a trade perspective.**

Professor John T. Cross, University of Louisville School of Law: **Do intellectual property rights undermine an emissions trading system?**

Professor Marianne Levin, University of Stockholm, Director of the Institute of Intellectual Property Law: **Intellectual property rights in “green” treaties – from Rio to Copenhagen and beyond.**

Professor Jens Schovsbo, Copenhagen University: **IPR and competition law: Wind of change?**

Researcher Mohammad Monirul Azam, Stockholm University: **Intellectual property and climate change after COP15: In search of a workable technology transfer framework for ESTs.**

Professor Tine Sommer, Aarhus School of Business and Social Science, Aarhus University: **Designing substantive patent law: From life sciences to climate change?**

Senior Research Fellow Morten Walløe Tvedt, Fridtjof Nansens Institute: **Current changes in international patent law: Are they likely to promote environmentally sound technologies?**

Dr. Catherine Rhodes, University of Manchester: **Opportunities and constraints for cooperation between international organizations.**

Associate professor Karin Buhmann, Institute of Food and Resource Economics, LIFE, Copenhagen University: **Mandatory Danish CSR-reporting – from ‘business case’ for CSR to ‘government case’ for addressing global concerns? Reflexive law as explanatory model and model for inspiration.**

Panel Discussion: **Solutions and barriers to innovation and transfer of environmentally sound technologies (ESTs) in current environmental law, trade law and IPR law.**

Panel: Professor John T. Cross, Professor Hans Christian Bugge, Associate Professor Morag Goodwin, Professor Marianne Levin

Moderator: Professor Sanford Gaines, Aarhus School of Business and Social Science, Aarhus University

DAY 2: Global solutions and social responsibility: The legal toolbox of tomorrow for addressing climate change

Professor Jonas Ebbesson, University of Stockholm, Director of Stockholm Environmental Law and Policy Centre: **Good governance and climate change.**

Professor Ellen Margrethe Basse, Aarhus School of Business and Social Science, Aarhus University, **Global solutions and social responsibility based on the Copenhagen Accord.**

Professor Tushar Kanti Saha, National University of Lesotho: **Climate change, food security and poverty pattern in Lesotho – a case study.**

Professor and Senior Researcher Ole Kristian Fauchald, Oslo University/Fridtjof Nansens Institute: **Can soft law instruments contribute effectively to the prevention of climate change?**

Professor Andrew Long, Florida Coastal School of Law: **Regulating at the linkages: improving international environmental law through multi-issue mechanisms.**

Lecturer Rónán Kennedy, School of Law, National University of Ireland: **Information and communications technology & environmental regulation.**

Professor Lars S. Smith, University of Louisville: **The role of exclusive intellectual property rights with scientific research.**

Doctoral student Damilola S. Olawuyi, University of Oxford: **Legal and institutional barriers to the transfer of environmentally sound technologies to developing countries through the Kyoto Protocol's clean development mechanism.**

Dr. Fernando do Rego Barros Filho, Master's student in environment and development, Federal University of Paraná, Brazil: **Global concerns and renewable energy policies: The use of regional vegetal resources to create growth zones in developing countries.**

Panel Discussion: **How to engage policymakers at national and global levels; What new approaches or policy mixes are needed to address global concerns and overcome differences between developed and developing countries?**

Panel: Professor Jonas Ebbesson, Professor Ellen Margrethe Basse, Professor Tushar Kanti Saha, Professor Andrew Long

Moderator: Professor Hans Chr. Bugge, University of Oslo

