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# **A quest for solution: The Legal Challenge to Support the Environment.**

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## **The Challenge of Regulatory Cosmopolitanism**

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## 1. Introduction

People always have been creative and innovative. It is the basis of our evolution. However, this creativity has altered the global environment to the extent that our survival as mankind has become questionable. Major problems like pollution, climate change, loss of biodiversity, exhaustion of natural resources endanger our planet and society.

Parallel with above mentioned evolution, science and technology progressed: synthetic biology, nanoscience, metal mining, 3-D printing, etc. These innovations can solve some problems and could eventually protect our wellbeing. Signs of radical changes in the world system are already noticeable. However an adequate legal framework is necessary to provide structure and to avoid the use of (new) technologies and science that would be harmful for the environment. The question is thus if our actual legal system, and more specific the environmental regulations and intellectual property rights, is appropriate and adequate. And if the answer is negative how should regulation change. This paper is mainly pragmatic, it aims at providing a framework and a tool to research the actual regulation of sustainable development and more specific the role of intellectual property plays in stimulating or hindering the development of sustainable technologies.

This paper aims at providing a first understanding of the framework in which the innovation and the sustainable development<sup>1</sup> take place. In concreto the effects and consequences of new relationships between institutional actors in our society and the validity and attainability of open innovation as a new model for research and development, will be researched. Furthermore, an investigation of the existing regulations relating to sustainable development is mandatory. Bringing these elements together should give a solid basis for the tackling the final research project on the role of legal instruments, like intellectual property rights (IPR) and other regulatory tools to support sustainable development and solutions for the actual environmental problems. The following chapters describes the changed societal roles, the process of Open Innovation and “new” regulations as they were implemented during the last few decades. It is in essence a multidisciplinary approach whereby different opinions and views are welcomed. Hopefully this paper challenges you and leads to further discussions and insights that you would like to share.

## 2. No way back: globalization as a given.

Globalization is a popular word. In the broad sense of the word it is growth to a worldwide scale, through the process of becoming more connected. In philosophical language “*globalization refers to fundamental changes in the spatial and temporal contours of social existence, according to which the significance of space or territory undergoes shifts in the face of a no less dramatic acceleration in the temporal structure of crucial forms of human activity. Geographical distance*

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<sup>1</sup> Sustainable development is the development which meets the needs of the present without compromising the ability of future generations to meet their own needs, from A/42/427. Our Common Future: Report of the World Commission on Environment and Development, Chapter 2, <http://www.un-documents.net/ocf-02.htm#I>

*is typically measured in time.*”<sup>2</sup> The common denominator is connection throughout the world. Translated into practice it means that we all influence each other.

The first step to this global world was the liberalization of trade and capital markets, plus the establishment of global and regional organizations supporting this liberalization.

In 1994 the World Trade Organization (WTO) was founded with the primary objective to “*open trade for the benefit of all*”.<sup>3</sup> Providing a common institutional framework for trade relations to his members, the WTO aims “*to raise standards of living, ensuring full employment and a large and steadily growing volume of real income and effective demand, and expanding the production of and trade in goods and services, while allowing for the optimal use of the world's resources in accordance with the objective of sustainable development, seeking both to protect and preserve the environment and to enhance the means for doing so in a manner consistent with their respective needs and concerns at different levels of economic development*”<sup>4</sup>. Since 23 July 2008 143 countries are member of the organisation. This is 79 % of the sovereign nations in the world.<sup>5</sup>

The increasing trade globalization and the emergence of new technologies enabling worldwide communication have undoubtedly an impact on the cultural and social characteristics of all nations. On the one hand this has led to a certain levelling out of differences and the universal recognition of some concerns, like climate change or loss of biodiversity. However, significant differences still exist. For instance, the world is still divided in developed and developing countries. Additionally the developing countries can be further categorized as very poor countries and emerging markets, the latter being more advanced in their progress to a “developed” status. Society structures in the three categories differ. One example is the focus on sustainability and sustainable development. Sustainable development is recognized as a valid objective in developed nations, but is as criterion for economic activity, for obvious reasons, only slowly accepted in the developing and emerging markets. Most likely the spreading of the sustainable development concept will happen in close relation with the attainment of an adequate standard of living as described in the Universal Declaration of Human Rights.<sup>6</sup> At this moment the developing and emerging markets still focus primarily on their economic growth. Consequently the developed countries will have to take the lead in solving the environmental problems and in making the transition to sustainable development.

However, the magnitude of the actual problems necessitates a worldwide solution and the environment needs protection on that global level. Developing and emerging countries will need to do an effort despite their “entitlement” to a standard of living comparable to the developed world. This standard of living does not only have an economic dimension but a healthy

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<sup>2</sup> The Stanford encyclopaedia of philosophy, <http://plato.stanford.edu/entries/globalization/> (accessed 19 September 2010).

<sup>3</sup> [http://www.wto.org/english/thewto\\_e/whatis\\_e/wto\\_dg\\_stat\\_e.htm](http://www.wto.org/english/thewto_e/whatis_e/wto_dg_stat_e.htm) (accessed on 25 September 2010).

<sup>4</sup> Article II and pre-amble of the Agreement Establishing the World Trade Organization.

<sup>5</sup> <http://www.nationsonline.org/oneworld/states.htm>

<sup>6</sup> Article 25 (1) of the Universal Declaration of Human Rights: Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family,....

environment can also be considered basic Human Right. Indeed environmental conditions have a huge impact on wellbeing, enjoyment and even life itself. Already in 1972<sup>7</sup> the United Nations recognized this link between human rights and the environment. In the Rio Declaration on Environment and Development the connection was officially confirmed.<sup>8</sup> But the practical application of above statements proved to be difficult. The Western world has to take its responsibility. The following paragraphs describe the societal aspects in the developed countries that will impact on the realisation of sustainability, namely the evolution towards different institutional roles (chapter 3) and the impact thereof on innovation (chapter 4) needed for the developed of the necessary new technologies.

### **3. A different structure of interactions: the Triple Helix.**

Traditional institutional roles and behaviour faded during the last decades. On the basis of their relevance for this paper we will focus on three actors: business – government – academia. Historically these spheres had their specific roles and operated within these. Businesses produced economic goods, government developed policies and implemented a regulatory system and academia developed and disseminated knowledge.<sup>9</sup> Nowadays, academia create spin-offs following the economic and commercial model, industry takes up education through company universities and the government acts as a venture capitalist. They all perform tasks that originally belonged to another institution and increased their responsibility in other activity areas. These changes are conceptually described in the Triple Helix model, “a spiral model to capture multiple reciprocal relationships” that exists between different institutional actors in society.<sup>10</sup> It is a model describing the new relationships, especially in the field of communication and innovation.

The Triple Helix model certainly reflects the increased complexity of our society. However, in my opinion the public is missing in the model. The citizens of a country or region have become more assertive during the last decades and interfere with the actions and decisions of the institutional parties in the Triple Helix. Although the influence of the people might not be direct, they do have a considerable impact on the behaviour and interactions of government, business and academia. Organized in non-profit or non-governmental organisations (NGOs), these organizations can formally represent the public. They interfere with business by “commercial” organisations (like Oxfam) or with academia in the form of learning networks (like Plan C) or by setting standards (for example through labels). Their role is specific and therefore these organizations cannot be classified in one of the other institutional spheres. During the last decade, some commercial companies also started working together with them. The two following examples give an impression of the role in society of these NGOs. Chiquita designed together

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<sup>7</sup> United Nations Conference on the Human Environment, held in Stockholm in 1972, <http://www.un-ngls.org/orf/pdf/ru90hrsd.pdf> (accessed 20 September 2010).

<sup>8</sup> Especially but not exclusively, principles 1, 3 and 4, Rio Declaration on Environment and Development, <http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm> (accessed 20 September 2010).

<sup>9</sup> LEIGH Jerome, Building an Institute for Triple-Helix Research Innovation, National Institute for Triple Helix Innovation, University of Hawaii, 2006, p 3, <http://www.triplehelixinstitute.org> (accessed 20 September 2010).

<sup>10</sup> ETZKOWITZ, The Triple Helix of University - Industry – Government, Implications for Policy and Evaluation, Science Policy Institute, 2002, p. 2, [http://www.sister.nu/pdf/wp\\_11.pfd](http://www.sister.nu/pdf/wp_11.pfd) (accessed on 29 July 2010).

with Rainforest Alliance a set of guidelines for growing and processing bananas in an environmentally and socially preferable way.<sup>11</sup> McDonalds created a partnership with Environmental Defence on packaging. Later on McDonalds also assessed the environmental impacts of their supply chain with Conservation International.<sup>12</sup> And the Nano Risk Framework developed by Dupont and Environmental Defense<sup>13</sup>, an initiative that is discussed in more detail later in paragraph 4.2 under self-regulation.

A discussion on the role of the public in the actual society is however beyond the scope of this paper. Therefore the Triple Helix<sup>14</sup> consisting of the three actors (government – business – academia) will be used. This concept is characterized by following three dimensions:

- The first dimension is the internal transformation of the relations in each of the helices: for example lateral ties among companies based on strategic alliances within a sector, or universities working together across country borders.
- The second dimension concerns the influence of one helix upon another: for example a government stimulates universities to assist in innovation, or businesses detach employees to work with government officials.
- The third is the generation of an overlay of the three institutional roles (each of them represented as a helix): business-government-academia work together thereby performing tasks that traditionally belonged to one of the other partners.

The Triple Helix visualizes that in a knowledge-based society a system of overlapping interactions grows whereby the interest of each actor tends to be integrated in the new structure.<sup>15</sup> For example, for businesses it makes sense to partner with institutions of higher learning. BP has developed structured relationships with several universities to help them refine their strategic planning.<sup>16</sup> Microsoft partnered with the Indian Institute of Technology for its education of software engineers.

Government and industry in Flanders concluded binding agreements to meet the regulatory obligations set by the European Union. In concreto the government has concluded Environmental Policy agreements with industry sectors on polluting emissions into the air. The sector organisations impose these limits on their members, i.e. the companies.

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<sup>11</sup> <http://chiquita.com/#/BeingGreen/>, (accessed 12 September 2010).

<sup>12</sup> ESTY Daniel and WINSTON Andrew, *Green to Gold*, Yale University Press, 2006, 366 p. 186.

<sup>13</sup> “Environmental Defense” is a NGO funded in 1967 in the USA approaching environmental problems through four key strategies: sound science, economic incentives, corporate partnerships and getting the law right, <http://www.edf.org/home.cfm> (accessed 30 September 2010).

<sup>14</sup> GIBBONS Michael (e.a.), *The new production of knowledge – the dynamics of science and research in contemporary societies*, Sage, London, 1994.

<sup>15</sup> UGHETTO Elisa, Foresight as a triple helix of industry, university, and government relations, *Foresight*, 2007, vol. 9 nr. 5, Emerald Group Publishing Limited, p 14-18, p 14- 18, <http://www.ist.psu.edu/viewdoc/download?doi=10.1.1.63.9747&rep...>, (accessed 2 August 2010).

<sup>16</sup> ESTY, p 81.

In some projects all three institutional actors work together. An example is the there is the European EPOBIO<sup>17</sup> project. EPOBIO is an international “science-to-support-policy” project to “realize the Economic Potential of Sustainable Resources - Bioproducts from Non-food Crops”. Participants come from the European Union and the United States, from academic research institutions and from industry. They work together with an International Advisory Board of researchers, industrialists and policymakers.

These societal changes in institutional roles have an impact of the format of environmental regulation as implemented during recent years. The actual tendencies in these “new” regulations will be analyzed in the following chapter, including a first assessment of the role of values and moral rights.

#### 4. New environmental regulation as a reflection.

The earliest environmental legislation was mainly focussed on obligations and the compliance thereof. Environmental issues were considered to be local and observable. For example during the industrial revolution coal became the common and widespread generator of power. Air pollution by industrial plants was one of the observable consequences. Mining activities contaminated soil, often to such an extent that an effect on plant growth was noticeable. Consequently, regulators implement laws to counter this pollution. The focus was on limiting emissions, obliging permits for industrial activities and rules regulating specific industry sectors or specific media (air, water, soil).<sup>18</sup>

In the second half of the 20<sup>th</sup> century the public became increasingly aware of environment and its importance. But only during the last decades a general apprehension on the magnitude of the environmental issues and challenges emerged. In 1983 the Brundlandt Commission launched the notion of “environmental protection” shifted towards “sustainable development” with the ultimate goal to attain sustainability. The difference between environmental protection and sustainable development is that the latter is defined as “*the development that meets the needs of the present without compromising the ability of future generations to meet their own needs*”.<sup>19</sup> Sustainable development is a more holistic concept. It focuses not only on environmental protection/pollution, but incorporates many more aspects like our lifestyle, our philosophy and the way we deal with the world. The Brundlandt Commission was also the first to state that economic and environmental policy can no longer be dealt with in separate compartments.<sup>20</sup> Sustainable development does not exclude neither the use of the environment nor the possible

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<sup>17</sup> <http://epobio.net/epobio.htm> (accessed 3 October 2010).

<sup>18</sup> RICHARDSON Benjamin, WOOD Stepan, Environmental Law for Sustainability, *Environmental Law for Sustainability*, p 4, [http://osgoode.yorku.ca/osgmedia.nsf/0/DBF215C2996EA5048525731000645537/\\$FILE/Ch%201%20Richardson%20Wood%20EL%20for%20Sustainability.pdf](http://osgoode.yorku.ca/osgmedia.nsf/0/DBF215C2996EA5048525731000645537/$FILE/Ch%201%20Richardson%20Wood%20EL%20for%20Sustainability.pdf) (accessed 1 October 2010).

<sup>19</sup> UNITED NATIONS GENERAL ASSEMBLY, *Process of preparation of the Environmental Perspective to the Year 2000 and Beyond*, 19 December 1983, <http://www.un.org/documents/ga/res/38/a38r161.htm> (accessed 5 October 2010).

<sup>20</sup> [http://www.un.org/esa/sustdev/csd/csd15/media/backgroundunder\\_brundtland.pdf](http://www.un.org/esa/sustdev/csd/csd15/media/backgroundunder_brundtland.pdf).

negative impact of that use, but it aims at restraining our behaviour to “harmless” for the actual world and the future generations.

Five years later, the Earth Summit in Rio de Janeiro not only confirmed above views, but made a major step forward. Several agreements were concluded, for example: the Convention on Biological Diversity, the Framework Convention on Climate Change, Principles of Forest Management, the Rio Declaration on Environment and Development, and Agenda 21, which required countries to draw up a national strategy of sustainable development.

At the next World Summit on Sustainable Development in Johannesburg in 2002 participants agreed that good governance is elementary for sustainable development. This includes environmental, social and economic policies that respect the rule-of-law and enable investments for sustainable development.<sup>21</sup> An adequate legal framework is thus essential.

#### **4.1 Was there an influence on lawmaking?**

The pressure on industry and on policy makers to reduce pollution and counter the depletion of the environment has certainly increased. In general, the public is now convinced that the professional originators (some individual self-reflection is mostly still lacking) of pollution or depletion are responsible for his impact on the environment (although self-reflection is still mostly lacking). Since the 1990’s overall goals and environmental performance became more and more the standards in new regulation and some new forms of regulations appeared.<sup>22</sup>

The changed relationships in society forced regulators to take into account the opinions and demands of their regulatees if they want their rules to work. This implies that regulators are impacted by local habits; motivations and culture have to be taken into account.

Today effective regulation means a sophisticated mix of regulatory tools and the focus broadened from environmental protection to sustainable development. New regulation is also the result of the societal changes in relationships between institutional organizations (cfr. Triple Helix), and highly influenced by globalisation and the lingering formal recognition of (global) values (cfr. cosmopolitanism).

#### **4.2 A mix of regulatory tools.**

Command and control is thus no longer sufficient and new regulations frequently set goals and performance requirements or work through market incentives or restrictions. “No data, no market” in the new regulation on chemicals is a famous example of the latter.<sup>23</sup>

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<sup>21</sup> Report of the World Summit on Sustainable Development, Johannesburg, South Africa, 26 August-4 September 2002, United Nations, p 8 (4).

<sup>22</sup> RICHARDSON, p 7-8 and HAUFLEER Virginia, New forms of governance: certification regimes as social regulations of the global market, in Meidinger, Oesten (eds.), Social and Political Dimensions of Forest Certification, Germany, 2003, p 237-245, <http://www.law.buffalo.edu/eemeid/certsem/Haufler.pdf> (accessed 24 September 2010).

<sup>23</sup> Article 5, Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a



Examples of these “softer” requirements in regulations developed and implemented by governments can be found in recent environmental rules. One example: the recent Directive on the use of pesticides.<sup>24</sup> The directive contains a mix of regulatory options: Command can be found in the aerial spraying (article 9) and the obliged regular inspection of equipment (article 8). Market influence happens through the requirement for sale of pesticides; f.e. distributors must have sufficient certified staff present at the time of sale (article 6). Providing information to the general public (article 7), together with awareness-raising programs stressing the risks and potential effects for health, should create consensus, acceptance and support for the regulation. All of this is supported by control through the obligation to report and penalties in case of infringements. Also the content of this directive reflects the societal evolution and priorities, namely sustainability, integrated approach, sharing of best practices, etc.

Next to classic regulation, the government also implements regulations together with industry and/or non-governmental organisations. Through this process of negotiation binding rules can be implemented. This co-regulation approach was for example used by the Flemish government when concluding Environmental Policy agreements<sup>25</sup> with industry sectors. After negotiations with the sector organisations of both the chemical sector<sup>26</sup> (Essenscia) and the sector of electricity producers<sup>27</sup> (FEBEG), the Flemish Government signed with each of the organisations an “Environmental Policy Agreement” imposing emission limits on the reduction of SO<sub>2</sub> and NO<sub>x</sub>, on all their members.

Sometimes an exclusive private initiative is taken. The resulting regulation is often motivated by marketing benefits (ISO-standards) or aims at preventing negative public reactions (corporate social responsibility policy, sector standards). In such a self-regulation concept the private sector develops regulation on its own or with other actors. In other words: industries subject themselves to rules they developed. The “*Responsible Care*” programme is such an initiative. The objective of this voluntary agreement is to work with “*due care for future generations.*” Several leading chemical companies (like DuPont, Dow, Bayer, BASF, Solvay) committed themselves to high environmental standards, sometimes well above those set by law. Their efforts and results can be followed on the internet through a dedicated website.<sup>28</sup> Participating in this initiative has become a competitive advantage.

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European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, *O.J. L* 396 of 30 December 2006.

<sup>24</sup> Directive 2009/128/EC of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides, *O.J.L* 309, 24 November 2009.

<sup>25</sup> On the basis of the law “Decreet van 15 juni 1994 betreffende de milieubeleidsvereenkomsten”.

<sup>26</sup> <http://www.lne.be/themas/luchtverontreiniging/20090710-mbo-nox-essenscia-vlaanderen-finaal.pdf>

<sup>27</sup> <http://staatsbladclip.zita.be/staatsblad/wetten/2010/08/16/wet-2010035579-print.html>

<sup>28</sup> <http://www.responsiblecare.org/page.asp?p=6406&l=1>

In 2003 ten global banks initiated environmental review obligations embedded in the Equator Principles. At this moment 68 banks are member.<sup>29</sup> The principles are a voluntary set of standards for determining, assessing and managing social and environmental risk in project financing in order to ensure that the projects we finance are developed in a manner that is socially responsible and reflect sound environmental management practices. The banks can enforce challenging standards quite effectively due to the dependency of many countries and businesses on external financing.

The Nano Risk Framework is a project of two partners: a business partner in the chemical industry and a non-governmental organisation. Trying to protect their research and development in nanotechnology, Dupont, a transnational chemical company has developed together with Environmental Defense, a US non-profit environmental advocacy group the framework. Its objective is to manage and reduce potential risk during the whole lifecycle of nanomaterials<sup>30</sup> by:

- identifying potential hazards to human health and the environment
- assess the potential release and exposure to nano's
- manage risks to workers, consumers, the general public and the environment during production, use and disposal.

The 3 elements (hazards, properties and exposure) work together in the sense that they point out where the highest risk is<sup>31</sup> and where eventually compensation is possible.<sup>32</sup> Although prior to the implementation of REACH, the framework is on several aspects remarkably in line with the regulation.

#### **4.3 Reciprocal leverage: a tool for analysis is needed.**

It is my opinion that new actions and formats are created through reciprocal influences. In order to improve the effectiveness and timing of regulatory initiatives it would be useful to have a model for developing and managing regulations in line with societal evolution. For such a model I refer back to the analysis of Professor Brownsword in his book *Rights, Regulation and the Technological Revolution*<sup>33</sup>. Notwithstanding the use of the model per regulatory mode, it can, in my opinion be used as a matrix for the regulation of specific (subject) areas, like chemicals, biodiversity, ecosystem services, etc. Following paragraphs explain why and how.

In line with the model of Lessig<sup>34</sup> we could classify the different forms of regulation in four regulatory modes. The four constraints that influence human behavior are: law, social norms, market and architecture.

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<sup>29</sup> <http://www.equator-principles.com/principles.shtml>

<sup>30</sup> Contract letter of August 30, 2005, [www.environmentaldefense.org](http://www.environmentaldefense.org)

<sup>31</sup> Nano Risk Framework, Environmental Defense and Dupont, [www.nanoriskframework.org](http://www.nanoriskframework.org), p 27-83

<sup>32</sup> Ibid. p 83

<sup>33</sup> BROWNSWORD Roger, *Rights, Regulation, and the Technological Revolution*, Oxford University Press, 2008, 324 p.

<sup>34</sup> LESSIG Lawrence, *The Law of the Horse: what cyberlaw might teach*, Harvard Law Review, 1999, p 501-546, p 506, [http://cyber.law.harvard.edu/works/lessig/LNC\\_Q\\_D2.PDF](http://cyber.law.harvard.edu/works/lessig/LNC_Q_D2.PDF) (accessed 25 September 2010).

The law tells us how to behave, but so do social norms. But they differ in enforcement: law is centrally controlled by a government, whilst social norms are controlled by society, i.e. the community. Law can thus enforce a minority opinion, whilst social norms are based on the opinion of the majority in the area (geographically or mentally) concerned. Social norms can have a very strong impact on behavior even against or above law.

The third regulator is the market: for example price setting plays an important role in this. It influences how and what people consume.

The last one, architecture, is the physical world. The physical surrounding influence behavior to the extent that some behavior is not possible or is on the contrary stimulated. Two examples may clarify this: communities separated by a river with no way to cross it, will have little opportunity to bond. On the other hand, a market place surrounded by café's invites people to mingle and thus integration is stimulated.

An example of the four modes working together can be found in the area of chemicals. The law is represented by the REACH regulation obliging companies to register their chemical substances if they want to market them. REACH also foresees in the phasing out of some dangerous chemicals. However the citizens of Europe do not agree with the list of candidates for the phasing out. At this moment the candidate list contains 18 substances.<sup>35</sup> ChemSec<sup>36</sup>, a non-profit organisation developed an alternative list<sup>37</sup> that now is accepted by six member states<sup>38</sup>. A bit later Vice President Tajani and Commissioner Potočnik have requested ECHA to speed up the process on authorization and visited ECHA. This is an example of social norms in the sense that the influence society and its norms and culture can have on the opinion of authorities and by consequence on the formal regulation.

On the other hand there is the issue of the button on the jacket. Some member states differ in opinion with the European Chemical Agency (ECHA) on the calculation of the percentage of very dangerous chemicals in composed products (like computers, cars, shoes). The interpretation of the legal formula used by the six dissenting member states results in a lower amount of these dangerous substances than the interpretation in the guidelines publicized by ECHA. Both parties stick to their view and the Commission has endorsed the interpretation of her agency. But, the six member states decided not to endorse the publication of the parts of the Guidance that relate to the interpretation of the limit.<sup>39</sup> The refusal to endorse could be seen as a clash between the cultural or social norms in some member states and the formal authority of the European Commission and its institutions.

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<sup>35</sup> [http://echa.europa.eu/chem\\_data/authorisation\\_process/candidate\\_list\\_table\\_en.asp](http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp)

<sup>36</sup> The International Chemical Secretariat

<sup>37</sup> SIN = Substitute It Now

<sup>38</sup> This group of Member States, including the Netherlands, Germany, Austria, France, Sweden and Denmark, has now agreed on a list of 478 substances, corresponding to 90 percent match with the SIN List.

<sup>39</sup> HOPPENBROUWERS Marianne, Dilemmas of economic interests versus protection of human health and the environment influenced by the need to manage innovation, *European Integration between trade and non trade*, Workshop Maastricht University, 16 April 2010.

The market influences the use of chemicals also. For example, some special substances that produced in small quantities could still be delivered under the REACH regulation, but are no longer available because of the imbalance between the registration costs and profit margin.

Concerning the fourth mode, one could state that Europe is the architectural environment: the place where stakeholders meet.

When adding to the four modes the three dimensions of Murray and Scott<sup>40</sup>, a matrix can be developed, that can be used to visualise and analyse the interaction between the modes and dimensions within an area of regulation.

The three dimensions are: (1) objective, rule, norm, (2) monitoring and feedback, and (3) adjustment, realignment.

The result is a table visualizing actions in a subject area. Again we refer to chemicals as an example.

**Fig. 1: the Brownsword model**

	<b>LAW</b>	<b>SOCIAL NORMS</b>	<b>MARKET</b>
<b>Regulatory position</b> (goal, standard, rule or norm)	REACH regulation to increase safety for environment and health when using chemicals and promoting competitiveness	Eliminate dangerous chemicals: SinChem and CARACAL alternative lists for chemicals to be authorized. Calculation the maximum dangerous substances in a complex article– friction between ECHA and public opinion.	Life cycle management and environmentally friendly production as competitive advantage
<b>monitoring responses and pressure for compliance</b> (mechanisms)	Registration of chemicals, exposure scenario's, safety data sheets.	update of candidate list by ECHA, SinChem puts pressure on ECHA	monitor consumption and market share of chemicals, implementation of new business models (like Chemical Leasing).
<b>enforcement in case of non-compliance</b> (mechanisms)	no registration = no market	pressure from European Parliament on ECHA, court proceedings on obligation to provide information initiated by NGO.	negative image, decrease of market share.

Above matrix<sup>41</sup> should be useful for the mapping of relevant influences and consequently giving a view of the changed relationships in society, the possible need for adjusting existing regulation and the creation of comprehensive policies.

## 5. Open Innovation: an innovative research process?

### 5.1 A new approach: Life Cycle thinking.

First we need to refer to another evolution that also has an impact on our thinking and thus on innovation, namely the emergence of life cycle thinking. The term “life cycle” refers to all the steps in the life of a product: raw material, production, distribution, use and disposal and all other steps necessary in this process. Environmental problems call for an integrated approach. Consequently environmental regulation should consider the life cycle of products whereby the environmental effects are taken into account. In line with the focus on sustainable development, life cycle thinking will only increase in importance.

Cradle-to-cradle is probably one of the most notorious examples. But even before the launch of Cradle-to-Cradle in 2002<sup>42</sup>, two Directives with a beginning of life cycle approach were implemented in Europe. The first one concerned the restriction of the use of certain hazardous substances in electrical and electronic equipment<sup>43</sup> (RoHS) and the second one regulated waste of electrical and electronic equipment<sup>44</sup> (WEEE). Both stimulate life cycle thinking: RoHS works on the input of material in the end-products by banning the use of certain hazardous substances. WEEE regulates the end-of-life stage or waste phase. The American Electronic Association commented on the impact of these directives by stating that *“the new rules fundamentally alter every high-tech company’s business strategy not just for the European Union, but also for its global supply chain management”*.<sup>45</sup>

Another breakthrough was the new European legislation on chemicals. In 2006 the REACH regulation<sup>46</sup> was finally implemented, after quite a long process of debates and opposition from the industry. The regulation was revolutionary in the sense that it puts the responsibility for the safe handling of chemicals with the companies and that it considers the whole life cycle of the chemical. Exposure scenarios should include a description of the manufacturing and use during

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<sup>41</sup> Although the information in the matrix is correct, this is only an example. A full analysis of the subject “chemicals” is however necessary for use in research.

<sup>42</sup> <http://mbdc.com/detail.aspx?linkid=1&sublink=27>.

<sup>43</sup> Directive 2002/95/EC of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment, *O.J. L* 37 of 13 February 2003.

<sup>44</sup> Directive 2002/96/EC of 27 January 2003 on waste electrical and electronic equipment, *O.J. L* 37 of 13 February 2003.

<sup>45</sup> ESTY, p. 74.

<sup>46</sup> Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, *O.J. L* 396 of 30 December 2006.

the whole life cycle of the substance, as well as the risk and management of the risk. The life cycle includes even the waste phase, although waste is as such excluded from REACH.<sup>47</sup>

## 5.2 The paradigm of Open Innovation.<sup>48</sup>

All of above changes, as conceptualized in the Triple Helix and in Life Cycle Thinking, have an impact on the innovation process. And the urgency and complexity of the environmental issues adds to the need to change the actual slow research and development process (R&D).

Traditionally R&D leading into new products is performed within the company surrounded with a halo of secrecy. In this closed process it takes several years and considerable financial investments to develop a marketable product.

But, globalisation, supported by the emergence of new communication technologies, increased mobility of highly skilled employees and free trade across many countries, make it increasingly difficult to keep the information inside a company. Some companies discovered that this evolution is not necessarily negative. The spread of information increased also its access, what could speed up their innovation processes and reduce the costs of research. They started to look outside their own company for ideas and data relevant for their own objectives in R&D.

Chesbourg analysed this evolution and developed the concept of Open Innovation based on his observation of the changes in the management of innovation.<sup>49</sup> Open innovation is now described as “*both a set of practices for profiting from innovation and also a cognitive model for creating, interpreting and researching those practices*”.<sup>50</sup> Five significant factors characterize the model:

- external knowledge plays an equal role to internal knowledge,
- a close link exists between the innovation and the business model of the company,
- the evaluation of internal R&D happens through the business model whereby the fit with the model is the main criterion,
- technologies that lack commercial value for the developing company can be commercialized,
- companies need to manage their IP consciously and pro-actively.

The model can thus be defined as: “*Open Innovation includes the use by firms of external sources of innovation and the ability of firms to monetize their innovations without having to build the complete solution themselves*”.<sup>51</sup>

The acceptance of external knowledge considerably widens the availability of useful and high quality knowledge, especially in our increasingly mobile and connected world.

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<sup>47</sup> Article 3, 37 of REACH.

<sup>48</sup> Open Innovation should not be confused with Open Source, the latter relating to open access to source material for the development of further end products.

<sup>49</sup> CHESBOURGH Henry

<sup>50</sup> CHESBOURGH Henry, VANHAVERBEKE Wim, Open Innovation: A New Paradigm for Understanding Industrial Innovation, *Open Innovation, Researching a new Paradigm*, Oxford University Press, 2008, p 286.

<sup>51</sup> WEST, p 109.

Contrary to the closed innovation model, Open Innovation has a close link with the company's business model. This connection provides perspectives that formerly were not available. Ideas of smart people outside the company, but useful within the framework of the business model can be used, and inventions from within the company but not fitting in the business model can be brought to the external market. The latter is not possible in the closed innovation model, bringing innovations that are not suitable for own purposes, to the market is just not done. IP is used to protect the own inventions from being used by others. Consequently many patents were kept inside the company.

In Open Innovation inventions and knowledge do not have to be kept inside anymore. Buying and selling of knowledge has important benefits. So, an active IP management becomes a critical element: IP flows in and out of the company and can be used to stimulate the exchange of knowledge, speed up the innovation process and create additional revenue.

Open Innovation also has a societal benefit compared to the closed model, where companies adhering stopped the marketing of many patents, since it is their belief that by doing so they safeguard developmental freedom for their internal staff.<sup>52</sup> A survey of European, North American and Japanese firms showed that more than 35 % of patents remain unused. These unused patents are held by nearly two-thirds of organizations and one in eight has at least thousand patents sleeping.<sup>53</sup> More specifically in the period 1993-1997 34 % of the patents in the EU-8 countries were neither used internally nor licensed.

Because of the link between Open Innovation and the business model of the company, it becomes possible to make a more accurate assessment of the usefulness of the invention. On the basis of such an assessment, the company can then decide to expand the actual business model or to put the innovation on the market through licensing or through other channels, creating additional revenue.<sup>54</sup> Thereby the use of all patents is stimulated and false negative outcomes<sup>55</sup> are less likely to occur, since every invention is usable in one way or the other.

Society benefits, because knowledge is more widely diffused and used.

But Open Innovation is a horizontal model involving external parties that brings with it new forms of cooperation. There will always at least two organizations involved: one that created the innovation and the other who will use it. In many cases however, more parties will be involved, especially in highly complex and scientific matters. Universities will participate and get paid for

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<sup>52</sup> CHESBOURGH Henry, VANHAVERBEKE Wim, 2008, p 4.

<sup>53</sup> DIRECTORATE-GENERAL INTERNAL MARKET, What are patents actually worth? The value of for today's economy and society, *Study on evaluating the Knowledge Economy, Final Report lot 1*, May 2005, 53 p., [http://ec.europa.eu/internal\\_market/indprop/docs/patent/studies/patentstudy-summary\\_en.pdf](http://ec.europa.eu/internal_market/indprop/docs/patent/studies/patentstudy-summary_en.pdf) (accessed 18 September 2010).

<sup>54</sup> DE JONG Jeroen, VANHAVERBEKE Wim, Policies for Open Innovation: theory, framework and cases, *Vision era.net*, July 2008, p 15-16, <http://www.openinnovation.eu/download/OIPAFfinalreport.pdf> (accessed 15 September 2010).

<sup>55</sup> False positives are ideas/technologies that have been judged to have good opportunities and then turn out to have less success and false negatives are ideas that are erroneously judged not to have any potential.

their services. For example biotechnology research at universities is increasingly funded by private companies.<sup>56</sup> The government can participate as a provider of capital. This is in line with the overall evolutions in society to more vague and interacting roles of institutions as described in the Triple Helix model.

Since the usability of the model will depend on the appropriability of the innovations and the relationships within the inter-organizational network, the legal system in which the Open Innovation operates, will have a major impact. Disclosure of innovation between the parties involved is necessary to enable a cumulative innovation.<sup>57</sup> Lack of appropriability may result in non-disclosure and return to closed innovation in order to safeguard revenue. An Open Innovation Business Model has to consider both the value creation and the value capture (i.e. revenue) for all participants in the network. IP will have an important role in this.

## 6. The urgency of the questions.

The regulation of the environment has an impact on a lot of basic human needs like food, housing, health and indirectly also on culture and social relationships between nations and individuals. An effective environmental management and sustainable development would certainly support article 28 of the Universal Declaration of Human Rights states: *Everyone is entitled to a social and international order in which the rights and freedoms set forth in this Declaration can be fully realized.*” And does the Rule of Law not state: *“The laws are clear, publicized, stable and fair, and protect fundamental rights, including the security of persons and property”*.<sup>58</sup>

Therefore human rights and global values should be taken into account whenever developing and implementing regulation concerning these topics.

In practice this is rarely the case. For example: in the IPCC’s fourth assessment report human rights are scarcely signaled in almost 3,000 pages of analysis of literature. The lack of references to human rights indicates that there is also not much literature on the subject.<sup>59</sup>

Besides the moral motivation, there are other benefits linked to taking Human Rights into consideration. Moral rights can provide direction and help defining priorities. Attention to human rights helps defining widely acceptable and adequate policies for the use and transfer of technologies, by providing parameters to identify needs and potential solutions. Another effect could be the development of a clear regulation preventing dislocation of polluting companies to developing countries with less regulation. And last but not least, the recognition of moral values

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<sup>56</sup> WEST Joel, Does Appropriability Enable or Retard Open Innovation, *Open Innovation, Researching a new Paradigm*, Oxford University Press, 2008, p 119.

<sup>57</sup> WEST, p 116

<sup>58</sup> The World Justice Project, <http://www.worldjusticeproject.com/rule-of-law-index/>.

<sup>59</sup> HUMPHREYS Stephen, Climate Change and Human Rights, A rough guide, *International Council on Human Rights Policy*. ATAR Roto Press SA, Switzerland, 2008, p.3, [http://www.ichrp.org/files/reports/45/136\\_report.pdf](http://www.ichrp.org/files/reports/45/136_report.pdf) (accessed 7 October 2010).



and Human Rights in environmental and economic legislation could form the basis for regulating the liability of private actors for their role in harms caused at a distance.

Whilst formal regulation is still at the beginning, some private initiatives, clearly reflect human rights and moral values. Of course, it would somewhat be naive to suppose that moral values are the only driver in this matter. Economic principles remain important and, in my opinion, there is in essence nothing wrong when these. On the contrary the combination could be very powerful. Some examples are:

The “Equator Principles” of the banks is such an initiative to protect the environment. It is a condition for funding that projects are developed in a socially responsible way and reflect sound environmental management practices. At the same time they admit that this initiative create a positive image of the banks and helps to get business from environmental conscious project owners.

The “Nano Risk Framework” developed by Dupont and Environmental Defense is a guidance for safe management of projects in nanotechnology, but it also tries to protect the research and development in that area from a negative public opinion (like happened with GMO’s).

Another example is the multi-stakeholder initiative, namely The Forest Stewardship Council (FSC). It is an association open to membership of organizations and individuals representing social, economic and environmental interests. FSC promotes “environmentally appropriate, socially beneficial, and economically viable management of the world's forests” on the basis that these forests meet social, ecological and economic rights.<sup>60</sup>

The changes mentioned in the former paragraphs point to an increasing appreciation of values. Social norms are driven by the cultural values of the stakeholders concerned. As a consequence of the mingling of societal roles and the increased awareness and assertiveness of people values are more present in policy making. This tendency can be noticed in the many studies on Human Rights, the recognition of the protection of the environment and sustainable development as basic values in the Declaration of Bioethics and Human Rights, the Millenium Development Goals<sup>61</sup>. In the declaration explicit reference to Human Rights is made: *“We recognize that, in addition to our separate responsibilities to our individual societies, we have a collective responsibility to uphold the principles of human dignity, equality and equity at the global level.”*

But values are abstract; they are translated in different ways into actions and thoughts. Mutual understanding could facilitate an acceptance across these different opinions. Signs are present that this is also happening, after all the new ways of relating described through the Triple Helix will stimulate mutual understanding and communication. The cross fertilisation of different attitudes, opinions and competencies facilitate a solution of the challenges of our world.

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<sup>60</sup> <http://www.fsc.org/about-fsc.html>

<sup>61</sup> <http://www.un.org/millennium/declaration/ares552e.htm>.

With all the new technologies and with the growing consciousness of the need to protect life and environment, an intelligent approach towards regulating is necessary. Regulators cannot disregard tendencies in society, power and influence of businesses and industry, and political power. A delicate balance is needed.

### **7. The ultimate quest: the adequacy of IP regarding sustainable development.**

Everything is connected. Many of the technologies of yesterday are at the basis of the problems of today. Thus, we need to do better and take up the challenges.

This paper is meant as a basis for further research. The main issues with IP relating to sustainable development and environmental protection are the protection of traditional knowledge, promotion of technology transfer, prevention of bio piracy, threats to biodiversity and impact on social equity.<sup>62</sup>

It is clear that this paper is only the start of what more and more seems to be a complex quest. The subsequent research will focus on technology transfer and social equity in relation to environmental issues and sustainable development. The linkage between IP and environment is however indirect; IP is a part of an overall system of incentives and disincentives regarding environmental topics.<sup>63</sup>

Following research questions are considered and open for discussion:

How will IP work within the framework of new societal relationships, Open Innovation and the need for sustainable development?

When should sustainable development/environmental issues be dealt by IP and when by other legal instruments?

Should exemptions in IP legislation be made for environmental protection and sustainable development?

And more fundamental:

Is property as we know it, the correct approach? Or should it be redefined or replaced in relation to the environmental protection and sustainable development?

How can the quest for an appropriate legal system for sustainable development, including specific regulation and indirect rules benefit from the recognition and acceptance of cosmopolitan values?

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<sup>62</sup> TARASOFSKY Richard, *Report on Trade, Environment and Intellectual Property Rights, Concerted Action on Trade and Environment*, Chatam House, June 2005, p.4, <http://www.iprsonline.org/resources/docs/Tarasofsky-CATE-IPRs.pdf> (accessed 20 August 2010).

<sup>63</sup> Ibid. P 9.

The basic axiom throughout the research should however be:<sup>64</sup>

“The legal IP system must strive for the equilibrium of rights among its users, which should, accordingly, not only comprise IP title holders, but also the society as a whole, so that the welfare of the society as a whole prevails.”

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<sup>64</sup> Personal opinion.

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