



**EUROPEAN PARLIAMENT**

*Science and Technology Options  
Assessment*

**S T O A**

**Current policy issues in the governance  
of the European patent system**

**STUDY**

**(IP/A/STOA/IC-2008-188)**





DIRECTORATE GENERAL FOR INTERNAL POLICIES  
**POLICY DEPARTMENT A: ECONOMIC AND SCIENTIFIC POLICIES**  
SCIENCE AND TECHNOLOGY OPTIONS ASSESSMENT

# **Current policy issues in the governance of the European patent system**

## **REPORT**

### **ABSTRACT**

The European Parliament has been working towards building a discussion platform and a resource for further policy actions in the field of intellectual property rights. The Science and Technology Options Assessment Panel has set the goal of further enlarging the area of investigation in light of recent policy developments at the European level. In particular, the current study covers current policy issues in the governance of the European patent system, such as the backlog issue, the enhancement of patent awareness within the European Parliament, patent enforcement, the regional dimension of intellectual property in Europe, patents and standardisation, the use of existing patents, and patents and competition. These issues were discussed in the conference with stakeholders from European to national patent offices, from private to public sector actors. As a result of the conference, it was stated the need for an IP strategy for Europe.

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## EXECUTIVE SUMMARY

The Science and Technology Options Assessment (STOA) Panel of the European Parliament published the final report of its project on 'Policy options for the improvement of the European patent system' in 2007. As a follow up to this, the Panel launched the project 'Current Policy Issues in the Governance of the European patent system' in 2009. As the first step in the current project, and in view of the results of the previous project, the Panel has organised a conference with the goal of reviewing issues related to the current status of governance of the European patent system.

The European Parliament has been working towards building a discussion platform and a resource for further policy actions in the field of intellectual property rights. The Science and Technology Options Assessment Panel has set the goal of further enlarging the area of investigation in light of recent policy developments at the European level. In addition, issues related to intellectual property (IP) are of interest to several different committees. Therefore, a common forum within the European Parliament could be set up in order to ensure coherent IP policy design, as stated in the policy options for the improvement of the European patent system.

One important aim is to work towards building a discussion platform and a resource for further policy actions linking Members of the European Parliament from different committees with stakeholders in order to improve decision-making on patent-related issues. It might be difficult for the current body of parliamentarians to make any commitments because of the approaching end of their terms. For this reason, the Lisbon Forum is regarded as a plausible solution to bridge the gap between the two legislative periods.

A Draft Report was prepared as a background paper for the conference. That paper and the input from the conference have contributed to the formulation of this Final Report. It is worth mentioning that the results of the project are not expected to support, defend or contest any of these issues, but rather to analyse them realistically, and to signal to what extent they may cause a need for policy intervention. Indeed, different opinions exist about the acuteness of the issues. This study aims at providing a balanced view on how important these problems are and why. The topics of this study follow.

**The backlog issue:** Over the last decade, the time for getting a patent, as well as the related backlog of patents has risen considerably. The consequence of this is an increase of legal uncertainty.

**Patent enforcement:** While European legislators are still negotiating a European Union (EU) Patent Litigation System which should handle disputes relating to both existing European Patents and Future Community Patents, small and medium size enterprises (SMEs) already encounter difficulties in enforcing their rights before national jurisdictions.

**Regional dimension of IPR in Europe:** The EU's Regional Policy is more and more associated with the achievement of the Lisbon Strategy, which aims at building up Europe as a world leader in the field of the 'Knowledge Based Economy.' Consequently, the funds made available for achieving this goal, which come under the competitiveness programmes, have dramatically increased over the past few years.

Patent and standardisation: In an information and communication technology (ICT) oriented world, standards are a key driver for innovation. However, co-existence with patents raises some questions. What could be the interface between ICT standardisation policy, IPR and competition law? What could be the balance between IPR, interoperability and competitiveness? How to ensure a correct balance between the interests of licensees and licensors and the transparency of licensing? How to identify relevant IPR in connection with standards?

The use of existing patents: Third Parties have access to relevant information relating to European patent applications via free access websites. However, once the European patent has been granted, it becomes a bundle of national patents governed by national laws.

Patent and competition: In the past few decades, the European Court of Justice has made the legal distinction between the existence and the exercise of IPR. While the first is not challenged per se, the second one has to comply with competition rules.

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# 1 INTRODUCTION

## 1.1 Background

The Science and Technology Options Assessment (STOA) Panel of the European Parliament published the final report of its project on 'Policy options for the improvement of the European patent system' in 2007. As a follow up to this, the STOA Panel launched the project 'Current Policy Issues in the Governance of the European patent system' in 2009. According to the study commissioned by the STOA Panel of the European Parliament (Cowan et al., 2007), the policy recommendations for the improvement of the European patent system are:

(i) Inserting the economic mission of the Patent System in the European Patent Convention (EPC) by:

- placing a preamble in the EPC, stating clearly and transparently the economic mission of the patent system.

(ii) Enhancing the governance within the European patent system by:

- establishing a standing committee within the European Parliament, which would focus on improving patent awareness among parliamentarians;
- creating a link between the European Parliament's standing committee and an independent and external advisory body;
- encouraging dialogue between the standing committee and the external body to deal with broader economic and social questions arising from trends and practices within the patent system;
- developing regular and public communication of patent policy decisions made by the Administrative Council of the European Patent Office (EPO); and
- ensuring a stronger patent competence in the Commission, and greater consultation of interested parties.

(iii) Improving quality aspects in regard to patentability standards and patent grant procedures by:

- introducing measures to counter-balance the pressure to grant a patent;
- discouraging the filing of lengthy and overly-complex patent applications;
- reducing the possibility for applicants to unduly prolong or complicate the examination procedure;
- involving third parties in the collection and evaluation of information on prior art;
- promoting the incentives for applicants to make their application public before the 18-month limit; and
- raising the standards for the inventive step requirement.

(iv) Dealing with emerging technologies by:

- allocating additional resources to EPO examiners in order to better assess prior art and avoid too broad patents;
- ensuring on-going deliberations on what is patentable and what is not.

(v) Increasing access to patented inventions by:

- exploring and supporting more flexible, non-exclusive exercises of patent rights, such as licence of rights, patent pools and clearing houses.

(vi) Facilitating defensive publications by:

- making possible the practice of the defensive publication of inventions into a publicly-available database.

## 1.2 Approach

Taking into account the previous policy recommendations, we conducted a review of previous academic and policy-making documents. For academic publications, we used Thomson Scientific's Web of Science, Elsevier's Scopus and Google Scholar as search engines in order to retrieve state-of-the-art literature. For policy-making documents, we employed Eur-lex, which provides online access to the EU official journal, treaties, legislation in force, preparatory acts, case law, and documents from the European Parliament, Council and Commission.

Further, the literature review addressed the research questions listed below, taking into account the policy options for each of the topics, viz. the backlog issue, the enhancement of patent awareness within the European Parliament, patent enforcement, the regional dimension of IP in Europe, patents and standardisation, the use of existing patents, and patents and competition.

The documents were selected because of direct relationship with the topics of the study. The academic and policy sources are listed in the reference list. An explanation of the analytic tool chosen is provided in the common structure (*problématique*, what is already known, what is new, policy implications) used to conduct the literature review.

In addition, we searched for relevant references dealing with the topics, and then sorted them into a coherent view of the state of the art as it now stands. In particular, we followed a common structure while carrying out the literature review:

1. *Problématique*: What is the issue at stake here? Why is it relevant? Why are we discussing this in the first place?
2. What is already known: What is the knowledge we are building upon? What has already been established? What is the current 'state of the art' in the topic?
3. What is new: What are the recent developments? What is currently being debated? What have we learned from the references? Which are the points of contention and their implications?
4. Policy implications: What are the future avenues of research or debate? What are the 'blind spots' that still need to be tackled? Where is the topic or issue headed? Is there a need either for policy options or fields that require policy actions? Are the major issues studied in the project being left out of the mainstream legislative process?

The literature review discussed published information on the particular topics. This literature review had an organizational pattern and combined both summary and synthesis. This literature review provides a guide to the topics and gives an overview or act as a stepping stone for further academic research where analytic tools can be employed, such as discourse analysis or document analysis.

In particular, we carried out the following tasks to achieve the overall aim:

- Retrieve references
- Review selected publications
- Digest and distil content
- Draft the review and provide policy recommendations
- Validate findings and suggestions by relevant stakeholders.

Finally, it is worth mentioning that the results of the project are not expected to support, defend or contest, any of these issues, but rather to analyse them realistically, and to signalise to what extent they may cause a need for policy intervention. Indeed, different opinions exist about the acuteness of the issues. In this respect, this study aims at providing a balanced view on how important these problems are and why.

### **1.3 The topics of the study**

The Science and Technology Options Assessment (STOA) Panel of the European Parliament has set the goal of further enlarging the area of investigation in light of recent policy developments at the European level. It is worth mentioning that the topics of the study have been commissioned by STOA, and have not been extracted from and defined through the literature review itself. In particular, this study covers current policy issues in the governance of the European patent system organised as follows:

- The backlog issue
- Enhancement of patent awareness within the European Parliament
- Patent enforcement
- Regional dimension of IP in Europe
- Patents and standardisation
- The use of existing patents
- Patents and competition

The backlog issue

Over the last decade, the pendency time for getting a patent, as well as the related backlog of patents, that the EPO has had to cope with has risen considerably. The direct consequence of this is an increase of legal uncertainty, because during this period of time, third parties have no clue about the future of the application (withdrawal, granting or rejection), nor of the exact scope of protection (in cases where the patent is granted). For the credibility of the patent system, it is of the utmost importance to ensure the shortest possible pendency time.

Enhancing Patent Awareness within the European Parliament - Standing Committee on IPR

Currently, the Council is dealing with IPR policy-making and the European Parliament being only consulted. Once the Lisbon Treaty will enter into force, the European Parliament will be associated to the Council in decision-making regarding IPR policy.

The new article 97a stipulates that: "In the context of the establishment and functioning of the internal market, the European Parliament and the Council, acting in accordance with the ordinary legislative procedure, shall establish measures for the creation of European intellectual property rights to provide uniform protection of intellectual property rights throughout the Union and for the setting up of centralized Union-wide authorization, coordination and supervision arrangements. The Council, acting in accordance with a special legislative procedure, shall by means of regulations establish language arrangements for the European intellectual property rights. The Council shall act unanimously after consulting the European Parliament."

In addition, issues related to IP are of interest for different committees such as JURI, IMCO, ITRE (for the technical and economic aspects), REGI (for the regional aspects of IP), and INTA (IP chapters in the Free Trade Agreements). Therefore, a common forum within the European Parliament could be set up in order to ensure coherent IP development within the Parliament, as stated in the policy options for the improvement of the European Patent System. A more appropriate structure (e.g. a standing committee, or a working committee with links to different committees) could be further explored.

#### Patent enforcement

While European legislators are still negotiating a EU Patent Litigation System which should handle disputes relating, at the European level, to both existing European Patents and Future Community Patents, SMEs already encounter huge difficulties in enforcing their rights before national jurisdictions. SMEs argue that court and legal fees are too high and do not allow them to take appropriate action before the courts. Thus, there is little interest for SMEs to get patents if they are not in a position to enforce them. Therefore, it would be necessary to find special schemes for SMEs: lower court fees, IP insurance (which could cover expenses relating to any legal action), Alternative Dispute Resolutions (mediation, arbitration) etc.

#### Regional dimension of IP in Europe

The EU's Regional Policy is more and more associated with the achievement of the Lisbon Strategy, which aims at building up Europe as a world leader in the field of the 'Knowledge Based Economy.' Consequently, the funds made available for achieving this goal, which come under the competitiveness programmes, have dramatically increased over the past few years. In this light, patents are one of the major tools which can foster innovation. Therefore, projects which could give an incentive towards the transfer of IP from academia to industry, and subsequently lead to the development of marketed products, should be encouraged in the future.

#### Patent and standardisation

In an ICT-oriented world, standards are a key issue. However, co-existence with patents could lead to tricky issues. What could be the interface between the ICT standardisation policy, IP and competition law? What could be the balance between IP, inter-operability and competitiveness? How to ensure a correct balance between the interests of licensees and licensors and the transparency of licensing? How to identify relevant IP in connection with standards?

### The use of existing patents

Third Parties have access to relevant information relating to European patent applications via free access websites, such as <http://ep.espacenet.com/>. However, once the European patent has been granted, it becomes a bundle of national patents governed by national laws. Consequently, third parties have to make enquiries in each Member State in which the patent has been granted, in order to know the status of the different national patents (still in force, existence of licenses, etc.). It would be useful to provide all the relevant information regarding the same patents on a unique database, which would help third parties in the preparation of strategies vis-à-vis these patents (analyses of the protected market, request for licenses). It would also ensure a better fluidity of the market for the benefit of Europe.

### Patent and competition

In the past few decades, the European Court of Justice has made the legal distinction between the existence and the exercise of IP rights: while the first is not challenged of itself, the second one has to comply with competition rules (cartel, abuse of rights). Over the last few years, this question has become more and more pertinent. For example, the Commission has recently launched a sector specific enquiry in the pharmaceutical field, with a view to detect potential misuse of patents. Microsoft was also recently fined for blocking third party access to its technology. This issue could be re-visited in light of these recent developments.

## 2 THE BACKLOG ISSUE

### 2.1 Problématique

According to the European Patent Office (EPO 2008a), the growing number of applications across the globe is leading to one particular challenge affecting every patent office – a large backlog. Thanks to a large staff and a relatively efficient application system, the European Patent Office has managed to keep its average first-action pendency period for patent examination down to between six and nine months, despite an official backlog of 284,414 in 2005. This compares with 21 months in the United States Patent Office and 26 months in the Japan Patent Office. Unlike other offices, the European Patent Office does not practice outsourcing.

The European Patent Office has witnessed a radical surge in the size of its workload. The most striking increase has been in the number of patent applications at the European Patent Office. From about 20,000 in the early 1980s, patent filings had jumped to 192,000 in 2005. This ten-fold increase in the number of patents has been accompanied by a parallel evolution, although to a lower extent, of both the average number of pages and the average number of claims per filing, which have doubled between 1980 and 2005. Over the past 25 years, the workload of the European Patent Office has been multiplied by 20 (van Pottelsberghe, 2007).

This drastic increase raises a crucial workload issue for the European Patent Office and an important quality issue for the European patent system in general. A large proportion of the recent patents describe only a small improvement upon the state of the art. The increased volume makes determining the actual state of the art almost impossible. One consequence is that a vicious cycle has taken place, including 'doubtful' applications being filed, which increases the workload, and hence may reduce efficiency (Philipp, 2006).

In a statement, the European Patent Office President Ms Alison Brimelow said that: 'the purpose of patents is to support the generation of economic benefits for society. However, large patent numbers are not necessarily indicative of growing research and development activity. What we therefore need is not more patents, but more, better patents. The European Patent Office aims to make sure that the patents it grants are relevant' (Barraclough, 2008).

### 2.2 What we already know

At the end of the 20<sup>th</sup> century, there were broadly-expressed concerns about quality in the patent system. The operational challenges that have raised these questions include the high volume of applications, many of which may not proceed to be granted but which meanwhile sit as potential threats to others' inventions. High volumes lead to backlog. This creates opportunities for industry to exploit uncertainty: high volumes of pending applications become bargaining chips in negotiations. Although such delay is rarely in the wider public interest, for some applicants it is convenient; for example, where technologies have a long payback period, or where the precise utility of an invention is not apparent at the time of filing. There is also concern that, faced with high pendency rates, patent offices ask examiners to work faster, risking them missing relevant prior art or misjudging obviousness (EPO, 2007).

Several factors partly explain this increase in patent applications. The differences in the size of Patent-Cooperation-Treaty<sup>1</sup>- and non-Patent-Cooperation-Treaty-applications reflect the impact of different patent systems and their harmonisation. The first filings at the United States Patent Office generally have a much higher number of claims than the first filings at the European Patent Office. As a Patent-Cooperation-Treaty filing is an international route that later allows the transfer of the application to several regional or national patent offices, applicants tend to apply for a single patent that will be transferred internationally, instead of several patents for different jurisdictions. In this respect, the Patent-Cooperation-Treaty filings seem to be more adapted to the American patent system than to the European one (Archontopoulos et al., 2006).

In particular, a typology of filing strategies has been used by Stevnsborg and van Pottelsberghe (2007) to characterise the applicant's behaviour: a good will with fast and slow track, a bad will with slow track and a deliberate abuse of the patent system. The chosen strategy will affect the patenting route, the patenting drafting style and the interaction with the European Patent Office. The deliberate abuse of the system includes drafting the application in a style that is deliberately deficient (i.e. with a large number of claims) and may induce an unwanted burden on the patent office, a disproportionate degree of uncertainty for competitors and the public at large, and an unclear published prior art.

Second, differences between sectors make up another factor which partly explains this evolution. For instance, biotechnology as well as information and communication technologies were the most dynamic sectors in terms of patenting over the past 10 years. In 2005, the patent filings in biotechnology contained 35 claims on average and communication and information technologies included 26 claims on average. Besides, a higher propensity to patent inventions has been observed for all technologies and in all countries, mainly driven by strategic patenting, such as patent thickets, picket fences, inventing around and defensive patenting (Guellec et al., 2007).

Third, changes in the geographical origin of patents provide evidence for the increase in patent applications. The fastest growth has been observed for patents whose assignees are from Asia. For example, Korean firms such as Samsung and LG are among those with the most patent applications to the European Patent Office.

Finally, additional factors include the firm's experience in patenting (i.e. the number of patents filed in previous years), the number of inventors involved in the patent application and the number of classes according to the International Patent Classification<sup>2</sup> (van Zeebroeck et al., 2006).

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<sup>1</sup> The Patent Cooperation Treaty is an international patent law treaty, concluded in 1970. It provides a unified procedure for filing patent applications to protect inventions in each of its Contracting States. A patent application filed under this treaty is called an international application or PCT application.

<sup>2</sup> The International Patent Classification, established by the Strasbourg Agreement 1971, provides a hierarchical system of language independent symbols for the classification of patents and utility models according to the different areas of technology to which they pertain.

Transatlantic patent count behaviour:

A much greater number of patents are granted in the United States than in Europe (Organisation for Economic Cooperation and Development, 2002; European Commission, 2002). This difference has already been explained by others as follows.

First, examiners at the United States Patent Office are encouraged by monetary bonuses to grant patent applications, a policy that has the unsettling effect of rewarding examiners for quickly pushing patents through the patent office. Specifically, each patent examiner receives a salary bonus based on how many final allowances or rejections of a patent he or she authorises. Because a rejection can be challenged and may not become final for quite some time, it is easier to receive a bonus by allowing patents (Merges, 1999).

Second, a backlog in the granting procedure at the European Patent Office (Abbott, 2004) means many applications are still pending.

Third, the European Patent Office employs higher standards than the United States Patent Office, as shown by applications in the biotechnology domain that are made in the United States but not in Europe, or by some applications made in Europe, where the American counterpart has been granted, that are then refused or withdrawn from the European procedure or revoked after opposition (Verbeure et al. 2006).

Fourth, it should be noted that these different forms of claims may not be all present in a single patent as official patent regulations in certain countries may require them to be divided into two or more separate patent applications. For instance, a product claim on the nucleic acid sequence and a product claim on a protein sequence can occur in the same European patent, whereas two different patents have to be filed for each type of product claim in the United States (Verbeure et al. 2006).

### 2.3 What is new

'It is true that the London Agreement has reduced the cost for validating European patents, as the patentee no longer needs to file translations of the entire text of the granted patent, but only the claims. We are still waiting for more states to join, but when they have, it will become significantly less costly to validate patents. It will be interesting to see how patentees will use the money saved. Some may validate their granted patents in more contracting states, thus using the saved money to pay more renewal fees. Others may increase their filing activity, and yet others may divert the savings to other areas altogether. While the increase in validations per patent would not negatively affect the backlog of the patent offices and might even provide the offices with increased funding from validation and renewal fees, we will probably see some increase in filings as a result of the London Agreement as well. It is still a bit too early to say how big the effect will be', says Schwarze (Zacco, 2008).

To the question of whether the European Patent Office has the political will and the ability to grant more patents in pace with the rising demand, Dunlop (2008) points out that the European Patent Office allowance rate has fallen over the past ten years, from nearly 70% in 1996 to about 52% in 2007. He provides plausible explanations of the fall, which include:

- poorer quality of patent applications (e.g. more patent applications chasing the same number of inventions or briefer descriptions);
- raising of the bar at the European Patent Office (for inventive step, sufficiency of disclosure and prohibition on added matter);

- growing backlog of applications awaiting oral proceedings (i.e. if easy cases are being granted and difficult cases are stacking up waiting for oral proceedings).

The number of patent applications in the State Intellectual Property Office of China rose from 100,000 in 2003 to 175,000 in 2005, a sign that the country has realised the importance of patents. While the total number of applications to the European Patent Office from China remains small (roughly 5,000 compared to 27,000 from the United States), most experts believe that Chinese applications will soon make up a much larger portion. In preparation, the European Patent Office has already intensified cooperation with China. Harmonisation and cooperation are crucial for dealing with the backlog issue. The Utilisation Pilot Project is a 12-month initiative to test whether the European Patent Office can use search work carried out by national patent offices on the same application. This pilot project is being carried out in the framework of the newly established European Patent Network, a strategic cooperation scheme involving the European Patent Office and the national patent offices. As patents are increasingly marketed globally, there exists a logical trend towards the harmonisation of patent laws. In this respect, the World Intellectual Property Organisation launched the Substantive Patent Law Treaty, a proposed international patent law treaty aimed at harmonising substantive points of patent law, such as novelty, inventive step, industrial applicability and utility, as well as sufficient disclosure, unity of invention, claim drafting and interpretation (EPO, 2008). It is worth mentioning that these discussions are in a deadlock and nothing concrete might be reasonably expected from these negotiations. In particular, the five biggest patent offices (United States, Japan, Europe, China and South Korea) are already trying to handle backlogs (European Patent Office, 2008b).

The Administrative Council backed a plan setting out how the European Patent Office should tackle its growing workload. The study was prepared by the so-called Board 28, which was appointed by the Council, following discussion with the President Ms Alison Brimelow and her staff. It contained recommendations on how the European Patent Office and national offices should deal with growing numbers of patent applications and increasing backlogs, as well as ensuring quality standards of European patents. The study recommends that the European Patent Office:

- utilises work done by others (by both patent offices in Europe and outside, and by applicants and third parties);
- raises the bar for patent granting so as to grant exclusive rights only for technical innovations with sufficient inventive merit;
- improves efficiency;
- boosts cooperation within Europe (for example, by building the European Patent Network);
- improves the ability to deal with new challenges, and reviewing governance and finance issues.

## 2.4 Policy implications

The evidence against a growing backlog is not conclusive, but comfort can be found in the Administrative Council Survey, which indicates that the production at the European Patent Office is growing faster than its incoming workload. The Survey consider three scenarios for the next decade and anticipates that except in a scenario of extreme growth, the programme of recruitment, building and training at the European Patent Office will more than cope with the demand (Dunlop, 2008).

According to van Pottelsberghe (2007), the workload of the European Patent Office will probably continue to increase in the future due to the following factors:

- First, the improved integration of the European market for technology through the London Protocol (based on the London Agreement) or the European Patent Litigation Agreement, might improve the attractiveness of the European Patent Office.
- Second, fast developing countries (e.g. India and China) might cause a potentially sharp increase in patent filings originating from these nations.
- Third, universities and public research institutes as new assignees might have an increased propensity to patent their inventions.

Strategic initiatives have been envisaged to deal with the fact that patent applications continue to enter the European Patent Office's examining divisions at a faster rate than the rate at which the examining divisions can dispose of them.

According to Schwarze (Zacco, 2008): 'one of the proposed solutions to the increasing workload problem of the European Patent Office has been to use the resources of the national patent offices to perform search or examination tasks, that is to outsource the work to national patent offices. However, this suggestion has been met with concerns from users who worry whether the European Patent Office can maintain its high level of quality of granted patents. Even some contracting states have raised concerns; they have stated that they have given patent granting authority to the European Patent Office, but that this did not involve giving patent granting authority to national patent offices in other countries. As opposed to this, some other offices are actively seeking work in a drive to increase their income and maintain local expertise. It is evident that these diverging opinions complicate the search for an agreement.'

Another recommended answer is the patent prosecution highway, adds Schwarze (Zacco, 2008): 'The idea behind the patent prosecution highway is that national patent offices benefit from each other's work, in particular from their search results. For example, once an applicant has received an allowance from the patent office of the first filing, corresponding applications in other offices may under certain conditions be fast-tracked. While the idea of reuse of work is to be welcomed in order to reduce backlogs, the devil lies as always in the detail. For example, this system will only work efficiently if the first-filing office prosecutes the application fast, as the other offices need to wait for the outcome of this examination. One should bear in mind that there already exists a well-established and very good system of work-sharing, namely the Patent Cooperation Treaty system [...] And one wonders whether a further development of the Patent Cooperation Treaty system might not be a more efficient way forward. However, we will have to wait and see whether the patent prosecution highway attracts the interest of applicants and proves a useful tool.'

To sum up, the backlog problem is not new and has not been unaddressed. Backlogs can be caused by an increase in the number of patent applications and patent size. A large number of patents granted could be explained by patent examiners' bonuses, legal and cultural contexts, claim forms, the geographical origin of patents, a firm's experience in patenting, the number of inventors involved in the patent application, and the number of patent classes involved in the application. An increase in the size of patents might be caused by the filing route choice, sector idiosyncrasies, and filing strategy. In order to tackle the backlog issue, the Administrative Council of the European Patent Office has been advised to follow strategic lines of enquiry.

## 3 THE ENHANCEMENT OF PATENT AWARENESS WITHIN THE EUROPEAN PARLIAMENT

### 3.1 Problématique

The European Parliament acts more and more as a co-legislator in the field of Intellectual Property (IP) (directive on the legal protection of biotechnological inventions, discussions relating to the Directive on the patentability of computer-implemented inventions). Once the Lisbon Treaty becomes effective, the European Parliament will be de jure co-legislator for all legislative initiatives in the field of IP. In addition, issues related to IP are of interest for different committees such as JURI, IMCO, ITRE (for the technical and economic aspects), REGI (for the regional aspects of IP), and INTA (IP chapters in the Free Trade Agreements). The issue treated here deals with the reason and the way for improving competences and awareness of EP on IP aspects. The first point presented is the need of developing a European strategy on IP.

A well-functioning and legitimate patent system is of uppermost importance for a knowledge-based economy. It sustains R&D, innovation, market penetration and welfare and it requires a strategy. While Japan and the US have developed their strategy and elevated IP issues to the highest political level, the European Union is still lagging behind. Improvement of the European patent system requires strengthening the role and expertise of the European Parliament in patent-related issues and accommodating the rise in public interest in patent matters (Cowan et al., 2007). European Union IP policy making is too fragmented and disconnected from other issues (competition, trade etc.); both insight and evidence-based IP policy is lacking.

Some of the reasons and options for improving patent awareness among Members of the European Parliament (MEPs) include:

#### ***Why (reasons)***

- The role of the European Parliament in guiding and monitoring the European patent system is growing.
- The European patent system is increasingly large and complex, reflecting the 'pro-patent era' (Kortum and Lerner, 1999) or 'intellectual capitalism' (Granstrand, 1999), and it needs both standard rules and flexibility to deal with different national/regional contexts, increasingly differentiated applications by technological fields, rising problems of coordination for promoting trans-national collaborations, etc.
- New kinds of problem come with the extension of the IP system: quantity vs. quality, private vs. social benefits (knowledge circulation and access), overcrowding and overlapping sets of rights in specific research areas etc.
- Ongoing reform of the European patent system needs to be managed and monitored because the political thrust towards unification is facing important challenges: the harmonisation of national patent regulations in the EU, the possible creation of an EU-wide Community Patent, the expansion and reform of the European Patent Convention, etc.

- Public interest in the IP system has grown: intellectual property rights (IPR) systems now attract attention, not only among the users of the respective IPR systems, but also more broadly among European citizens. Recent developments have led to intense debates and controversies as to how IPR should be designed (Harhoff, 2006). Examples of such controversies in Europe include: the debates on copyright and digital rights management systems, the protection of computer software through patents or copyrights, and the extent of patent protection for biotechnological innovations.
- Some of the renewed interest is created by the perception that over the last decades, IPR systems have strengthened the position of rights owners over those of the users of protected subject matter (Harhoff, 2006).

### **How (options)**

- MEPs' awareness could be improved by ensuring greater competence in patent matters through three kinds of tools:
  - use of IPR advisers by MEPs, and procuring studies and inquiries to deal with broader economic and social questions arising from trends and practices within the patent system;
  - information on EPO Council decisions;
  - regular consultations between MEPs and IPR system users and stakeholders.

## **3.2 What we already know**

The background document for the STOA Workshop held in June 2007 underlines that transparency and participation are fundamental in activities related to the European patent system. One of the main challenges is ensuring an increased level of transparency and political accountability. First and foremost, this involves strengthening the role and expertise of the European Parliament in this field, given that it is a critical participant in these sorts of discussions. The other main challenge is trying to accommodate the rise in public interest and wish for involvement of civil society at large in matters concerning the European patent system.

Complexity, extension and changes to the European Patent System are among the reasons for the need to improve MEPs' awareness:

- The IPR system is complex since it is the result of specific laws, administrative practices and court interventions.
- Changes in technology require changes in the design of IPR systems and pose important challenges to existing institutions, to policy makers and to the public.
- Patent systems are under pressure: patent applications and patents granted at the EPO have increased much faster (7.4% per year) than R&D inputs in OECD countries (3.4% per year).
- Patent costs in Europe are also a major policy concern (from three to five times the cost of patenting in USA or in Japan). These costs are not affordable by SMEs. The London Protocol should contribute to lowering the patenting costs in Europe, but then a quality-oriented patent policy will become a 'must'.

The market for technology is growing: the traditional view is that knowledge is difficult to transfer by markets, since its value depends on a large number of complementary assets in the hands of different individuals. Asymmetric information between suppliers and those who are seeking information or assets is another reason, but recently new intermediaries are pushing the market of ideas and disembodied technologies.

Several private equity backed funds in Europe purchase IPR and combine them to valuable portfolios that can be sold or licensed to potential users. IPR have been used in some cases as collateral for loans to SMES (Harhoff D, 2006).

In knowledge-based economies, modes of generation, appropriation, access, diffusion and distribution of knowledge (in science and technology) have become decisive for societal development and important areas of political debate.

The European patent system is characterised by technocratic decision-making. It lacks democratic legitimacy and accountability and has become increasingly inefficient (Schneider, 2006). The EU and the EPO are two worlds apart: they are two fully-independent supranational bodies and the EPO is not subject to EU and EC decisions

The EPO's self-governance is mainly based on the interaction between applicants and the EPO itself, and between granting departments and Boards of Appeal (quasi-judiciary bodies).

The EPO is an institution that is self-funded by the fees of patentees. The interests of parties other than the applicants are not represented, and there is the risk of capture by the applicants, who can be seen as customers to be served. Moreover, its limits for patent eligibility are expanding, it covers a broad scope of patents to be granted, and it demands a low threshold for inventive step. All these pose problems of patent quality, but also of power. There are two critical aspects: the inherent expansionist drive and the fact that innovation has to be qualified in terms of efficiency, sustainability and social desirability.

Questions of the separation of powers, accountability, democracy, legitimacy and control are of utmost importance. It may be necessary to re-balance the governance of the patent system, introducing more roles for the European Union, increased democratisation, legislative regulation of substantive patent law in new technological fields and improving the responsiveness of the European Parliament on IPR issues in the following areas:

- Public domain or 'Open' science
- Ethical limits
- Public health and cost issues
- Efficiency
- Alternative modes of innovation (e.g. Open Source).

By institutionalising the scanning of applications and grants of patents, patent information could be used as an early warning system for policy makers. This, in turn, may better inform regulators linked to, but outside, the European patent system.

### 3.3 What is new

The effectiveness and legitimacy of IPR systems are under scrutiny. If the innovation process is a social process, then the patent system is ultimately related to the sustainability of its social contract (Borrás, 2006).

The reflexive self-regulation of the EPO could be combined with mechanisms for greater responsiveness, including appropriate venues for legislative decision making and feedback loops with society. It may be desirable to strengthen the interface between the EU and the EPO through the following:

- qualitative reporting by the EPO on its practices, which can make implicit policy explicit (opening the black box);
- acknowledgement of the EPO's limits of competence as an executive body, requesting advisory support by national and EU legislators, and by the ECJ;
- systematic use of patent information for regulatory activities outside of patent law (e.g. health, environment, anti-trust, etc.).

MEPs need to improve their competence and expand their role. This can be achieved by creating positions for advisers and using advisory actions on complex issues, such as the impact of the European patent system on innovation and society. Advisers can flag up the potentially important developments, which may have an impact on economic and social issues and thus need further investigation. IP advisory activity needs multidisciplinary expertise in law, economics, social sciences and patent-related matters. Advisory action is a "feasible" solution, since, as we understood, other proposals such as an internal EP body, are too complex and less feasible.

The European Parliament can also set up temporary Committees and Committees of Inquiry when matters of political importance require it. These suggested committees could work for a set period of time with a defined mandate.

MEPs need also to have consultations with various practitioners and stakeholders, such as consumer groups, to identify challenges that may crop up and ways to deal with them and this can be done by hearings on specific topics, round-table meetings or Internet discussion forums.

### 3.4 Policy implications

Effectiveness and legitimacy are two inseparable issues for the success of governance systems.

Effectiveness deals with the quality of the output, the quality of IP and the use of both. Legitimacy deals with the balance between individual and social welfare, appropriation and the rules of dissemination (Borrás, 2006). The patent system is a concrete mechanism that seeks to generate an output by granting specific rights to actors and coordinating their interactions in different but interconnected contexts (regulatory and judicial spheres, market and product competition, technological dynamics). The importance of non-hierarchical network-based forms of coordination, under which different types of actors interact and cooperate, is growing.

The concept of network governance success, which looks at the formal and informal dimensions of interactions in systems, could be explored as a possible analytical framework for assessing if the governance of the IP system is successful. While an improvement in EP capacity of dealing with IP question is seen as a quality issue, the network governance is proposed for answering to the legitimacy aspect of governance. It is not contradictory, it is currently implemented also by EPO and it deals with the need of implementing flows of information and loci of participation. Network governance examples are the existing experience by EPO in forums, public hearings and open consultation. These involve mainly IP users and we suggest opening to a more diversified range of stakeholders.

A key aspect of the legitimacy of formal interaction in the European patent system is that it depends on national parliaments and on the European Parliament actively discussing matters and holding national representatives accountable for the functioning of the system. In the case of the European patent system this can be problematic, given its legal-technical and technological nature. Notwithstanding this, national parliaments and the European Parliament have been very active in recent years (in the areas of biotechnology and software patents). Nevertheless, the engagement of parliaments in the political debate is only one side of the question. Other dimensions are to be considered and improved, including the following:

- The ability of parliaments to scrutinise whether decisions are correctly implemented by the regulatory agencies, particularly by the EPO. This is still an open matter in the European patent system, which depends mostly on national parliaments' scrutiny via their respective national representatives of all matters concerning the EPO, rather than to scrutiny by the European Parliament, which concerns only EU-harmonised legislation and has no direct power over the EPO (Borrás, 2006).
- The effectiveness of the informal interactions that take place in the patent system, sometimes involving a large range of stakeholders. 'Today there is a strong epistemic community of technical experts in these matters in Europe, which is generally formed by legal professionals who meet regularly in a wide range of forums' (Borrás, 2006). The EPO is creating and sponsoring some of these forums, such as SACEPO and EURO-TAB. The EPO is also opening up to users through public hearings and open consultations, but these initiatives are focused on the users' viewpoint, and there are 'popular fears of the EPO being captured by large patenting firms' (Borrás, 2006). The chance of enhancing the general acceptance and legitimacy of the system is still limited.

The overall success of the governance of the European patent system could be better assured by creating a more diversified set of formal and informal mechanisms of legitimacy, expanding or creating new forums for dialogue with a wider range of representation, combining experts and non experts and opening the learning process.

## 4 PATENT ENFORCEMENT

### 4.1 Problématique

A major concern for patent applicants is the potential cost of patent enforcement in legal disputes (Bessen and Meurer, 2008). Litigation costs include court costs, fees for lawyers, patent attorneys and experts, costs of witnesses, technical investigations and costs related to appeals. The threat of being involved in a costly and uncertain infringement case, as well as the risk of retaliation, can negatively affect *ex ante* research and development (R&D) incentives, particularly for less financially endowed companies. Moreover, when a patent right is not credibly enforceable its private value vanishes and potential infringers have an incentive to act opportunistically.

In recent years, a number of studies have highlighted an increase in patent disputes both in Europe and the United States. Despite the growing number of patent suits, the number of cases terminating during or after the case has gone to court has been stable through time (Bessen and Meurer, 2005), which suggests an increasing role for extrajudicial settlements. Scholars are questioning whether the direct and indirect costs associated with enforcing patent rights are imposing an implicit tax on innovation in vital segments of the economy (e.g. Barton, 2000; Jaffe & Lerner, 2004; Hall and Ziedonis, 2007).

While the negative impact of excessive litigation has been largely identified, the policy action for the enhancement of patent enforceability within the European patent system has to face additional constraints relating to European institutional arrangements. Currently, an infringed patent holder has to defend its European patent across all jurisdictions in which the patent right has been granted, with an inevitable explosion in legal costs as well as in time-to-market opportunity costs.

Below, we show data on legal costs for patent infringement cases across European countries, although the additional implicit costs related to delayed access to final product markets are difficult to estimate. However, some recent estimates in the pharmaceutical sector highlight considerable variations between member states in the duration of patent litigation proceedings, with an average value of 2.8 years (European Commission, 2008b). In technological contexts characterised by rapid product obsolescence such lengthy procedures might represent a significant disincentive to R&D investments

Moreover, the various European national court systems are characterised by significant variations in the procedures adopted for handling patent cases. With respect to this situation, the urgent need for policy interventions devoted to fostering access to the patent system by guaranteeing higher enforceability is witnessed by the communication of the European Commission on the enhancement of the European patent system (European Commission, 2007a). Despite the harmonisation of procedures and remedies in the field of IPR infringements under the Enforcement Directive (European Parliament and Council, 2004), there are still important differences in national procedures and practices due to non-harmonised aspects of the collection of factual evidence, cross-examinations, hearings and the role of experts

## 4.2 What we already know

The literature has investigated the determinants and dynamics of patent infringements (Bessen and Meurer, 2005 and 2006; Harhoff and Reitzig, 2004; Lanjouw and Schankerman, 2004; Lemley and Allison, 1998; Somaya, 2003). Most of these studies support the existence of a negative effect from patent litigation that tends to limit the innovation incentives for smaller firms operating in specific technological domains characterised by high-patenting rates, such as biotechnology. For small and medium sized enterprises (SMEs), those constraints turn out to be more binding in industries with complex products; for instance, the information and communication technology (ICT) sector, in which the degree of opacity of the technologies covered by patents is higher and their actual coverage is less clear. The extensive survey data from R&D managers presented in Cohen et al. (2000) shows that the most prominent motives for patenting in technologically complex industries (e.g. biotechnology and ICT) include the prevention of lawsuits and the use of patents in licence negotiations.

The perception of limited enforceability of intellectual property rights might have a negative impact on individual or academic inventors. For example, Shane and Somaya (2007), using secondary data on licensing and interviews with technology licensing office (TLO) directors of research universities, find both qualitative and quantitative evidence that patent litigation has an adverse effect on university licensing activity. This adverse effect occurs because litigation disrupts overall TLO activity and reduces the time and resources available for commercialising technologies and formalising licences.

A report commissioned by the European Commission (European Commission, 2006b) provides the most up-to-date estimates. The incidence of litigation and related legal costs vary significantly across Member States. Germany turns out to play a prominent role, accounting for half the litigation carried out in the EU, with a ratio of actions to patents of 1 in 300. In France, the ratio is 1 in 5000 and in the United Kingdom 1 in 2000, while most other Member States fall somewhere between these two. With respect to legal costs, the United Kingdom, Germany and Finland appear to be the most expensive countries for litigation, first instance costs to judgment being respectively €550,000, €300,000 and €240,000. While in France, Italy and Belgium, those costs are around €70,000. It is important to stress that such figures are likely to increase significantly when appeals are taken into account as well. The report also provides estimates about the expected litigation costs before a unified European Patent Court. Such costs would vary between €97,000 and €415,000 at first instance and between €83,000 and €220,000 at second instance. Hence, the cost for defending a patent extended to three Member States is estimated on average between 10% and 45% less than the cost of today's parallel litigation at first instance and between 11% and 43% at second instance.

The figures reported above show how the risk of incurring a patent dispute can seriously deter patenting incentives for SMEs, institutions and individual inventors. The data on the incidence of actual disputes per granted active patent, which might appear at first glance to be relatively small, need to be carefully interpreted. In fact, most patent infringement cases are eventually solved through extrajudicial settlements, whose conditions are not observable. Although the use of extrajudicial negotiations and licensing has positive welfare implications (since both parties save legal costs), concerns have been raised when the relative bargaining power of the parties are highly asymmetrical. For example, when SMEs are sued by large incumbents or when companies adopt strategic patenting behaviours explicitly aimed at extracting high royalties.

Several studies have contributed to shedding light on these aspects. Firstly, Cremers (2004) provides an empirical analysis using data from 714 patent infringement suits filed at two of the three main district courts in Germany (Mannheim and Düsseldorf). Results strongly support the hypotheses that the expected patent value has a positive and significant impact on the probability of litigation. Furthermore, patents which survived an opposition procedure have a higher probability of being litigated against. Individuals face a smaller probability of being involved in patent suits while small firms have the highest risk of litigation. Second, Harhoff and Reitzig (2004), after analysing a sample of more than 13,000 EPO patents in biotechnology and pharmaceutical sectors, report that an opposition is filed in 8.6% of the cases. The empirical evidence demonstrate that the likelihood of opposition increases with patent value (estimated from the number of citations from subsequent patents that a specific patent receives after its grant date), and that opposition is particularly frequent in areas with strong patenting activity and high technological or market uncertainty.

The patent was revoked in 30.5% and amended in 40.6% of the opposition cases. Third, similar findings are reported by Calderini and Scellato (2004) for the ICT sector in Europe. In this area, there is an incidence of opposition of 5%. Among opposed patents, nearly 35% are eventually revoked while in 22% of the cases the patent claims are amended. Furthermore, the data on oppositions in the ICT sector reveals an almost negligible number of cases where both plaintiff and defendant are drawn from the main incumbents in the field. This might indicate that under the credible risk of possible retaliations, large companies are able to achieve cross-licensing agreements with each other, while adopting more aggressive behaviour against smaller patent holders. Finally, Lanjouw and Lerner (2001) find that the use of preliminary injunctions by large firms discourages R&D by small firms.

### 4.3 What is new

Patent litigation insurance has long been considered a potentially powerful tool for ensuring access to the patent system for SMEs, which do not have extensive legal resources and are put off from developing, patenting or litigating patents on new technologies owing to the expense and complexities in the European patent system. Patent litigation insurance can take the form of defensive policies or offensive policies, which in some cases can be combined. Defensive policies are also known as 'patent infringement defence insurance' or 'patent liability insurance' and indemnify the subscriber for the legal fees and expenses required to defend an action for revocation of one of his patent rights, following unintentional infringement of someone else's patent. Offensive policies, also known as 'pursuit policies', become active when someone else infringes the subscriber's patent.

Despite the potential beneficial impact of such insurance schemes, different analyses (European Commission, 2006b) have highlighted how patent litigation insurance has not been particularly successful. There seems to be a scenario whereby high levels of premiums and relatively low indemnities do not provide adequate coverage. Nevertheless, different studies have identified through extensive interviews with patent-oriented companies and patent attorneys a strong interest in the establishment of an effective patent litigation insurance system.

Several factors have contributed to the very limited growth of the industry. First, patents are assets whose risk assessment represents a difficult and expensive task. Second, trial durations and corresponding costs are highly volatile.

Third, insurers stress the risk of inducing opportunistic behaviours among insured firms; filing suits against competitors' patents, even if not infringing, can temporarily block their innovations. Finally, the risk of adversely selecting the portfolio of subscribers is regarded as being very high because of the absence of a regime of compulsory pursuit policies.

Some scholars have studied patent litigation insurance. For example, Llobet and Suarez (2006) show that a competitive insurance market should be able to provide patent litigation insurance policies tailored to the characteristics of each innovator (as the optimal deductible and premium depend on innovation-specific parameters), while making them compulsory might imply imposing the same policy on all patent holders. Hence, governments should simply focus on facilitating the existence of the market.

Regarding compulsory insurance as a solution to adverse selection risk, the discussion led by Buzzacchi and Scellato (2008) raises some relevant concerns. They show that the strategic value of the insurance is related to the possibility for the insured patent holder to deter entry by imitators, making litigation more credible, and increasing the bargaining power in case of settlement. However, the most interesting result pertains to the fact that even in a context of perfect discrimination and a competitive insurance market, only a sub-sample of innovators would find it profitable to acquire the insurance. Furthermore, given the high heterogeneity across industries in the rate of litigation, a compulsory insurance scheme would implicitly generate a form of cross-subsidisation from patentees operating in sectors characterised by low probability of litigation to those patentees operating in high-risk technological domains. Finally, the identification of an appropriate system of co-payments to discourage the insured from opportunistic behaviour and a contingent explosion in patent litigations appears to be a difficult task.

Two exhaustive studies by the European Commission have addressed the issue of patent litigation insurance. Insurers, brokers and industry representatives have been consulted in order to understand the feasibility of these types of insurance schemes. It has been reported that patentees will insure their patents if the premium and conditions are reasonable (between €300 and €600). Without compulsion, no currently envisaged scheme is likely to succeed. Although it may be possible to move back to a voluntary scheme later, once a scheme is well established, only a mandatory scheme can generate benefits (European Commission, 2006b).

An additional route to sustaining patent enforceability by SMEs might consist of favouring the establishment of alternative dispute resolution (ADR) systems and encouraging, if not requiring, parties to engage in mediation, conciliation or arbitration prior to seeking judicial remedies. The critical points are that they are voluntary processes, they require cooperation of partners and that the settlement should be binding. Kingston (2001) provides a detailed assessment of most of the critical issues of the patent system with regard to litigation and enforcement.

As far as expert arbitration is concerned, the WIPO has set up arrangements for arbitration of disputes (WIPO, 2008). But this has rarely been used because arbitration is voluntary and used only when both parties agree on it as a way of settling their dispute. Moreover, such agreement reflects comparable levels of economic strength. Arbitration is not used when the cost of litigation intimidates a weaker party to obtain justice. Nevertheless this type of approach to dispute resolution might represent an effective tool at least for a sub sample of cases jointly involving smaller firms.

Apart from that, the draft European Patent Litigation Agreement (EPLA) aims to establish a uniform jurisdiction for European patents. The intention is to create a unified system for litigation on European patents for those EPC contracting parties that wish to join the system (EPO, 2006).

#### **4.4 Policy implications**

The results of the large pan-European consultation launched by the European Commission in 2006 stress the urgent need for policy actions to provide 'a simple, cost-effective and high quality one-stop-shop patent system in Europe, both for examination and grant as well as post-grant procedures, including litigation' (European Commission, 2006a).

Given such a premise, it is clear that the improvement of the enforceability of patents should be a priority within the policy agenda dealing with the governance of the European patent system. The identification of appropriate policy options requires a preliminary in-depth understanding of the driving forces of the patent litigation phenomenon, as well as of the trade-offs related to specific policy interventions.

The joint analysis of the current available data and economic studies seems to highlight a set of relevant policy directions.

First, there is substantial convergence on the positive expected impact of the establishment of a unified jurisdiction for European patents. While concerns have been raised relating to the potential increase in translation costs during proceedings (which would negatively affect enforceability by SMEs), the data and the economic literature stress two points: from an aggregate perspective the establishment of a specialised court with trained judges will significantly deter opportunistic behaviours by patentees who pursue strategic patenting conducts, while the increase in expected litigation costs will be significant only for those patentees that are now extending their rights to a very limited number of Member States. The establishment of a uniform European jurisdiction would have an additional non-negligible positive effect with respect to any future process towards redefinition of the international laws governing the relationships between national patent systems, including the ongoing process of definition of the Anti-Counterfeiting Trade Agreement (ACTA).

Second, the introduction of a more effective litigation system cannot substitute for policies aimed at improving patent quality. The data on the patent litigation explosion in the United States, where a federal district court to deal with patent proceedings was established in the 1980s, show how the two-policy approach is strictly complementary. An improvement in the efficiency of the granting process can also be achieved by an enhanced partnership between the national patent offices of Member States and the EPO, while maintaining a high quality of patent rights. This can be achieved in particular by more efficient use of technical expertise to avoid unnecessary duplication of work or by optimal use of all resources. In this perspective is important to recall that in 2007 the European Council made a draft proposal for the general provision of the future Community patent. The improvement of the future capability of European SMEs to access and exploit the IP will depend on the completion of such legislative process.

Concerning the institution of a unified jurisdiction for patent cases in Europe, in 2009 the European Council published a revised draft statute for a European Patent Court (Council of the European Union, 2009). According to the draft, a Court of First Instance shall comprise a central division as well as local and regional divisions, upon Contracting States' request, when more than one hundred patent cases per calendar year have been commenced in that Contracting State. The Court shall comprise both legally qualified judges and technically qualified judges. The European Community and the Contracting States which are not Member States shall provide initial financial contributions necessary for the setting up of the Court. Concerning language arrangements during proceedings, which has been a major issue restraining the set up of a unified patent court, the draft statute states that parties will have to opportunity to agree on the language to be used in the legal proceedings and that the Court shall provide interpretation facilities to assist the parties concerned at oral proceedings. The future effective implementation of such a proposal might have profound positive impacts on patent enforceability in Europe, also for smaller patentees.

Third, public support for the creation and development of an insurance market for the coverage of litigation costs does not seem to be a viable and effective policy option. Public interventions in these specific fields bring an elevated risk of inducing undesired effects, including implicit cross-subsidisations from low-risk patentees to high-risk patentees and a potential increase in litigation rates.

Finally, public support for the establishment and diffusion of alternative forms of dispute resolution appears to be important. In particular, the experience of the WIPO arbitration and mediation system suggests that the opportunity exists to sustain the diffusion of this type of cost effective resolution system among European firms.

## 5 REGIONAL DIMENSION OF IP IN EUROPE

### 5.1 Problématique

A specific and growing role of regions in Europe is the management of the relation between university and industry at local or regional level, where innovation can be “user driven”. A relevant aspect of these relations deals with the transfer of knowledge from university to industrial companies, which can be managed through selling and licensing academic patents to industry. These activities can be managed directly by Universities and can be supported by regional policy (incentives for developing transfer office within or externally to Universities); moreover there is an increasing role of regional and local technology parks. Recent changes in the national legislation recognised the possibility of University to be entitled to IPRs on their patentable research results and this enlarge their involvement in knowledge transfer to the market. Regions can be the broker of academic IPRs or can support the university-industry relations through policy of network building. In the following the relevance and the problems of this regional dimension of IPRs are presented.

As far as regional dimension is concerned, we make clear reference in this chapter to the EU “place based” policy, to the EU “regional policy”, to the EU “cohesion policy” and to its improved content of innovation and competitiveness, therefore also on IP aspects.

This is a time of ‘opportunities that are being created by changes both in the way business is undertaking research and development (R&D) and in the way that universities are opening their doors to new forms of collaboration with business partners’ (Lambert, 2003). The biggest challenges in many European countries in this respect are on the demand side, since often businesses are not research intensive and their R&D activities are not impressive. In some countries (such as Italy, but also Germany) the industrial population is mainly formed by SMEs, whose specialisation can be far from the public research institutions’ interest and which are often strongly dependent on the local context. Moreover, SMEs are not aware enough of the role of IPR for their innovation and growth, while Higher Education Institutions (HEIs) and public research organisations (PROs), notwithstanding changes in their attitude towards involvement in economic growth aspects, are rarely oriented towards local problems. Finally, even if important reforms related to the technology transfer mission of HEIs are ongoing in European countries, organisations, incentives and regulation of the so called third mission of the public research institutions are different; consequently targeted, local-based policies are necessary, together with some European-level guidelines, e.g. towards HEIs and PROs IP management. All of this implies a role for public regional authorities.

The argument will take the following path:

- First, the recognition of a relevant role for place-based policy within the efforts to build a European Research Area (ERA).
- Second, the recent changes on the HEIs and PROs transfer mission in Europe and the identification of a key problem in the pathway from increased patent-based codification of research results towards transformation into commercial products.
- Third what specific role can be played by regional policy in fostering the use of public research results?

The European Commission recognises a role for regions in the European Research Area (European Commission, 2001a): regions emerge as dynamic players in developing and structuring ERA through focused efforts (i.e. a tailor-made research policy addressing specific territorial conditions, tuning national policy to the socio-economic needs of regions). It also recognises that the research and innovation policies autonomously developed by many European regions, while being in tune with their national counterparts, point to a new development model for the organisation of European research and innovation systems that is region-conscious. This involves targeting economic development through a systemic mobilisation of all resources available in regions towards concrete goals. The regional dimension of research, technology and innovation policy allows the exploitation of comparative advantage at regional level, while some more successful regions engage in innovative experiments in cross-border cooperation.

The efforts of regions in the 'ERA should have two clear objectives, both with a distinct value-added for European research and innovation policies: first to stimulate the uptake of research results into the local socio-economic fabric (especially vis-à-vis SMEs) and second to increase public and private investment in research and innovation in the regions'.

Some regional actions were considered eligible for co-funding at European level (European Commission, 2001a), such as:

- the creation or reinforcement of cooperation networks between firms, public research organisations (PROs), financial institutions etc.;
- staff exchange between public and private organisations;
- the dissemination of research results and technological adaptation within SMEs;
- the establishment of technological strategies for the region, including pilot projects;
- support for incubators for new enterprises with links to university and PROs and encouragement for spin-offs from universities or large companies;
- schemes for assisting science and technology (S&T) projects carried out jointly by SMEs, universities and PROs; and
- contributing to the development of new financial instruments (venture capital) for business start-ups.

Regarding regional initiatives, case studies of good practice from the regional programmes of innovative actions 2000–2006 show a large presence of programmes co-financed by regional policy in the EU-15 with the aim of trying out new approaches, new partnerships and new ideas for development. They are mainly cluster or partnership-based, driven by pilot projects and technology transfer oriented.

A role for technology and knowledge transfer (KT) in regional policies is recognised without specific mention of a regional contribution to intellectual property and IPR policy.

Another European Commission Communication contains a section relating to IP and affirms that 'there is still scope to make the EU IP system more responsive to the evolution of research processes and actions are needed to promote the optimal use of IPR systems in the EU, with a specific emphasis on academic institutions and smaller business' (European Commission, 2003).

In this respect, the Committee of the Regions (2004) endorses the Commission proposal for the EU to develop guidelines for the administration and exploitation of IPR and licences resulting from publicly-funded research, and supports the proposal for EU-wide IPR awareness and training activities for researchers and students, as long as these additional activities can be provided on a voluntary basis.

Since 2005, the European regional policy has also been more strongly associated with the achievement of the Lisbon Strategy. The Lisbon National Reform Plans were linked to the Cohesion Policy programmes for 2007–2013. With this new Cohesion Policy, resources shifted to implement the Lisbon Strategy. In this light, patents are one of the major tools which can foster innovation. Therefore, publicly-sponsored projects or public measures projects could give an incentive towards the transfer of IP from academia to industry and subsequently lead to the development of market-ready products.

The European Commission identifies the need to improve technology and KT between PROs and third parties as a key element of the European innovation strategy (European Commission, 2007c). To move in this direction a single European ownership model for PROs' IPR is seen as necessary: the idea is to have a coherent European landscape as well as a more level playing field.

The Council of the European Union invited the Commission to develop guidance on the management of IPR by PROs, and in 2008 the Commission issued a recommendation in which it provides Member States with policy guidelines for developing and updating national guidelines and frameworks (European Commission, 2008c). Moreover, the European Commission identifies those practices of public authorities that facilitate the management of IP in KT by Universities and PROs. Finally, the European Commission provides PROs with a code of practice in order to improve the way they manage IPR and KT. The code of practice gives, among other things, some guidelines for IP co-ownership arising from collaborative and contract research, which in European Member States, except in Denmark, is still based on a default regime, which applies in absence of any regulation, with the effect of high uncertainty and resistance to cooperation, especially between public and private parties. The practices of public authorities that facilitate the management of IP in KT concern mainly national authorities. They incentivise universities to create technology transfer organisations and monitor the impact of these actions or the PROs' IP policy. Already within the recommendations of an expert group report (ITTE, July 2004), the possibility of a 'general reporting system' on PRO transfer activities, adjusted to national needs, but including a number of common indicators, such as performance indicators (number of client enterprises, number of spin-offs, etc.) has been suggested.

Important changes were introduced during the 2000s in Europe, inspired by the Bayh-Dole legislation entered in force in United States in 1980, which gives to University the possibility of being entitled to IPRs on their patentable research results. The rationale of this important Act was to face the technological gap identified in the industrial productivity decline that started in the 1970s, through the introduction of specific incentives to the technology transfer from HEIs. The Act was designed also for reducing the conflicts among public funding agencies and between these and HEIs about the ownership of proprietary rights, by a simplification of the rules of IPR attribution. The law scope was also that of supporting the awareness of HEIs on the commercial utility and value of some research results and to give HEIs better control over applications of public research, including quality and ethical aspects.

The effects of the Act are still under scrutiny, since some authors maintain that its role has been over-valued, while other scholars point to evidence that the economic returns given by licensing activity to HEIs, when taking into account the costs of managing IPR and licenses, is very low and skewed by a few 'blockbusters'. In any case from 1980s in the United States the number of academic patents has grown up impressively and the licensing activity has accompanied it.

## 5.2 What we already know

The idea of a 'European Paradox' (a lack of research results use, in presence of a good scientific productivity) is still strongly diffused and supported by European analysis: the Innovation Scoreboard shows that Europe, even with a higher number of graduates in S&T fields in comparison with United States, is still behind in terms of innovation and patents. In particular, the number of academic patents in Europe is lower than that in the United States. Therefore, it is necessary to develop policies and strategies to transfer and commercially exploit academic results.

This evidence is counterbalanced by the results of relatively recent empirical studies, pointing out the widely-distributed presence in European countries of academic-based inventions owned by firms (PatVal-EU survey 2007). The current debate is about how to interpret these results: what kind/quality of research is behind these academic-invented patents? The open model of KT traditionally followed by universities, has been accompanied by consulting and contract based relations between industry and HEIs (especially in some disciplines), which, when producing patentable results, awards ownership to the firms. Moreover in some European countries there was also in the past (as in Italy since the 1930s) the possibility of academics patenting the results of public-funded research, but it has hardly ever been used. This publicly-sponsored research is often a more early-stage research, with a larger application range.

In sum, until the 2000s in European countries the results of academic-based research, which needed to be accompanied by a proactive public strategy of knowledge transfer and exploitation, and required additional work and costs without reward in terms of career or scientific recognition, have been poorly translated into codified and appropriable outputs. Transfer of knowledge, which is a core aspect of the relation between University and Industry, is largely managed at regional or local level.

In the 2000s, academic IPR reforms have been implemented in many European countries in order to promote a pro-active IPR strategy within HEIs, in some countries allowing IPR ownership by these public institutions. The reforms have been characterised by many differences among countries: some countries have abandoned the previous professor privilege in favour of an institutional IPR ownership, while others have kept or adopted it. What is important is that these reforms are part of a wider institutional change within public research systems, characterised by larger autonomy and more social responsibility. The administrative reforms allow universities to become organisations with a collective scope and control over their own results. Some studies (Della Malva et al., 2008; Baldini et al., 2007), looking at the change in public-owned academic patents as a function of time events, show that a more proactive IPR behaviour is visible in many countries after the introduction of this kind of New Public Management (NPM) reforms. These changes have been followed by the creation of specific transfer offices and internal to universities' IPR regulations, supporting the IPR strategy management.

### 5.3 What is new

Even if the number of academic-owned patents increased, the key problem is the low use of these patents. The performance of the transfer activity in terms of number of licenses of spin-offs taken up by industrial clients (including SMEs), even ignoring economic returns, is now recognised as neither a reliable goal nor the primary reason for knowledge transfer by HEIs. There is here a discrepancy between public research institutions and industry; while industry (in the form of SMEs) is often regionally dependent, HEIs and PRO are mainly striving for international academic recognition and a wide scale of fields; their interests do not match with those of local industry.

A survey (Crespi et al., 2006) on EPO patents identified two relevant kinds of problem:

- there is a high percentage of academic-owned patents that are not used: more than 40%, while licences account for only 5% of all academic-owned patents;
- there is a lack of IPR coming from collaborative research with public-private co-inventors and of co-ownership between public and private organisations.

Here there is room for regional policy, focused on:

- supporting the demand side of KT, but also building on specific infrastructure (incubators, science parks);
- promoting HEIs and PROs networking and collaboration with industry;
- supporting spin-offs with specific measures;
- diffusing IP awareness through training initiatives.

The construction of regional databases on public research results and IP can also be a fundamental tool for circulating knowledge to potential industrial users. This is a way to reduce barriers to accessing knowledge and pave the way to market for technology. Perhaps secondary effects may also be beneficial: e.g. the familiarisations with a technology, which may not be a direct KT, but raise awareness in local companies.

### 5.4 Policy implications

An expert group (Mac Donald, Capart et al, 2004) was organised by the Directorate General for Research (DG RTD) of the European Commission in the context of a series of activities supporting ERA. This expert group reviewed the evolution of the knowledge transfer models, from the open model (where PROs do not retain any IPR) to a licensing model (in which the PROs started to retain, protect and commercialise inventions based on their discoveries, by licensing IPR to industry or start-up companies, without any other involvement in the development of potential application. This licensing model has been successful in the United States, but it has not been as successful in Europe, because of a more fragmented market and a lower density of research-based companies headquartered in Europe.

Over the last ten years a third knowledge transfer model, which we call the Innovative model, has started to develop in Europe. In this model the Licensing Model, which is still important, has been supplemented by a more active policy of collaborative research with industry, in particular through EC Framework programmes and by a proactive involvement in the creation of spin-out companies. The results are 'comparatively more important at regional level' (Mac Donald, Capart et al., 2004).

In the collaborative model, substantial IP is generated by the PROs within collaborative or sponsored research and may be retained as a basis for further research and collaboration with the same or other partners. The further development of collaborative research on a fair and equitable basis is one of the essential components of the collaborative model. It is one of the ways by which proof of principle and demonstration of economic utility for PRO inventions and know-how can be funded with both industry and public financial support.

The common feature of Licensing and Collaborative models is the identification, registration and management of an intellectual property pool from which the various innovation models can be drawn. But in the Collaborative Model of KT the demand side is more stressed.

In this chapter, we developed an answer to the question of IP and regions particularly related to University-industry relations. Below we present some open questions and we provide some suggestions on possible ways of handling them.

Some problematic aspects may be nevertheless underlined:

- Under what conditions can the regions as innovation systems can well function in terms of technology transfer policy?
- To what extent is technology transfer taking place at global, national or regional level?
- Under what conditions can technology transfer be considered as a mechanism of integration at regional level? Differently phrased: can the question of university-industry relation be treated within a frame of local integration, without reducing the role of University? and do universities are interested in it?

Regions are positioned very differently with reference to newly emerging technologies, existing industrial capacities, knowledge and human resources basis. The selective environment at regional level could provide mechanisms for integration and innovation, but enhancement can have the cost of blocking innovation in other frameworks (supra-regional).

Possible solutions can come from:

- the presence of differentiated types of HEIs, which can dialogue with global, national or regional knowledge users;
- the support to linkages between backward regions and supra-national and European innovation networks;
- creation of networks for better integrated innovation development
- the promotion of public venture subsidies for promoting the entry of new, more technology-oriented firms at local level;
- regional support to national schemes;
- giving voices both to business and scientific institutions when deciding the regional priorities.

## 6 PATENTS AND STANDARDISATION

### 6.1 Problématique

A large number of high technology industries are based on technological and procedural standards. Standardisation is the process of developing and agreeing upon technical standards.<sup>3</sup> The presence of standards significantly affects the dynamics of investments in research and innovation in such industries due to the bundle of strategic interactions among innovators before the establishment of a new technology-based standard. The assignment and management of IPR clearly plays a crucial role in such strategic interactions. In principle, technological standards are welfare improving to the extent that they allow economies of scale in production, foster a more rapid diffusion of innovation, assure interoperability and reduce technological uncertainty and redundancy of R&D investments, particularly in markets characterised by the presence of network economies.

In such a context, Guellec and van Pottelsberghe (2007) recognise a two-fold relationship between patents and standards. Firstly, the strategic exploitation of patents can prevent the establishment of standards that would otherwise be socially desirable. Secondly, standards can excessively weaken or reinforce the market power provided by patents.

The first situation takes place when a firm holds a patent that is essential to a specific standard and refuses to provide it at reasonable conditions to current competitors and new entrants, opting to introduce its own (technologically inferior) standard. Notably, such a situation can be seriously worsened when there are multiple companies holding essential patents. The strategic relevance of the issue is witnessed by a recent paper by Goodman and Myers (2005) who show that, on the basis of experts' evaluations, up to 80% of the patents that firms claimed to be essential for a mobile telephone standard were not in fact essential (see also the discussion provided in Dewatriponts and Legro, 2008).

The second situation takes place when the owners of the IPR backing the standard refuse access to others at reasonable conditions. In this case, the scope of the original patent protection turns out to be over-extended, preventing the development of second generation or complementary products (Mueller, 2002). An additional welfare-detrimental strategic behaviour of patent holders, whereby they exploit the presence of technological standards to increase the value of their patent portfolio at the expense of collective welfare, relates to the so-called hold up problem. During the standardisation process a company might decide not to disclose its patents in order to favour the convergence of other players towards a specific standard. The same company, after the adoption and diffusion of the standards can then make claims on the basis of owning essential patents that require the payment of royalties from those producers that have already incurred relevant sunk costs (Henkel and Reitzig, 2008).

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<sup>3</sup> A standard is a document that establishes uniform engineering or technical specifications, criteria, methods, processes, or practices. The goals of standardisation can be to help with independence of single suppliers (commoditisation), compatibility, interoperability, safety, repeatability, or quality.

While the latter conduct has been considered a form of competition abuse, there are still open issues, both in terms of academic research and policy actions, about the impact of different forms of inter-firm agreements for the management of IPR within standardisation processes. A number of recent legal disputes confirm the relevance of the issue (see the US FTC decision in 2006 on the Rambus case).

## 6.2 What we already know

In order to identify the potential role of governments in the issues at stake it is important to recall that standards can be established by simple market selection processes, by spontaneous industry bodies or standard-setting organisations (SSOs), or by governmental bodies. In each of these situations, different rules are set to manage the IPR related to the standardised technology. In this respect, Lemley (2002) conducted a detailed assessment of the rules for the management of IPR in numerous standard-setting organisations, revealing how in most cases they impose limitations on members by forcing them to cross-licence their patents under reasonable and non-discriminatory conditions. However, only in rare cases are such mandatory prescriptions extended to non-member firms.

The influence of the openness and 'closedness' (i.e. protection by IPR) of standards on dynamic competition has already been analysed in early works by Farrell and Saloner (1985) and Farrell and Katz (1998). The main finding is that openness leads to price and quality competition within a common standard, whereas proprietary standards lead to competition between different specifications and therefore make fragmentation of the market more likely.

In addition, Blind and Thumm (2004) analyse the relationship between strategies to protect patents and their impact on the likelihood of joining formal standardisation processes. Their results support the theoretical hypothesis that companies at the leading edge are often in such a strong position that they do not need the support of standards to market their products successfully. At the case study level, different studies report evidence of conflicts within a formal standardisation process due to interests of patent-holders, especially in the telecommunication sector (for the standard of Global System for Mobile communications or GSM see Bekkers et al., 2002).

Because most technological standards are defined by industry bodies, Lemley (2002) has surveyed the rules and bylaws of 29 different standard-setting organisations, mainly in the area of telecommunications and computer-networking industries, where many of the most contentious intellectual property issues arise. This analysis shows that standard SSOs significantly contribute to ameliorate the problems of overlapping IPR and that there is a dual role for government: to support the emergence of private-ordering agreements by limiting excessive ex-ante antitrust pressure and to scrutinise the standard-setting process to ensure that IPR functions as intended.

Furthermore, Chiao et al. (2006) have compiled a database of nearly 60 industry-based SSOs. They identified how the presence of a provision mandating royalty-free licensing is negatively associated with the presence of a disclosure requirement, while weaker reasonable-and-non-discriminatory (RAND) licensing requirements are strongly associated with such a provision. Finally, Leiponen (2008) suggests that in many cases standard setting occurs within a network of loosely affiliated organisations and that a firm's position in that network can influence its effectiveness within a focal SSO.

### 6.3 What is new

Patent pools may represent a solution for reducing the transaction costs caused by the integration of patent-protected technologies into standards. A patent pool is an agreement among patent owners to licence a set of their patents to one another or to third parties. They are deemed to be particularly useful when a large number of patents has to be considered for integration into a standard (e.g. GSM). When subsequent innovators must negotiate with such large numbers of patent holders, they may face excessive transaction costs (Heller and Eisenberg, 1998). However, in order to establish and run patent pools efficiently and to promote their general welfare advantages, some potential conflicts and disadvantages (e.g. the misuse of price-fixing mechanisms) have to be taken into account.

There is now widespread agreement among policymakers and scholars that patent pools may benefit both intellectual property owners and consumers, provided that the pools include patents that are complementary or blocking (Merges, 1999; Shapiro, 2001). Lerner and Tirole (2004) analyses the strategic incentives to form a pool in the presence of innovations which either compete with or are complementary to patents in the pool. They find that a pool is welfare improving as long as the patents included are actually complementary. In principle, patent pools might also reduce the problem of padding (the inclusion in the pool of allegedly 'essential' patents that actual are not) since the pool's members have incentives to monitor behaviour so as not to share their revenues with participants whose IP is not making a contribution (Dewatriponts and Legros, 2008).

However, despite the attractiveness of this type of inter-firm agreement, it has to be observed that the standardisation of a technology which is based on a pool of patents does not automatically mean that the technologically, or even economically, superior solution will succeed. Even if wide-ranging patent pools covering all major key players may solve conflicts between patent holders, they have to be carefully monitored because they may overrule better solutions from individuals or smaller consortia with weaker patents or economic power (Blind and Thumm, 2004).

### 6.4 Policy implications

The contributions examined highlighted the absolute importance of improving an institutional and legal framework to support the effective diffusion of European standards, taking into consideration IPR-related issues within a context of voluntary and market-based standard setting processes. In this regard, the European Commission supports the view that standards should be open for access and implementation by everyone, with IPR relevant to the standard being taken into account in the standardisation process, aiming to establish a balance between the interests of the users of standards and the rights of owners of IP (EC, 2008b). Furthermore, the European Commission clearly stated that standardisation processes will represent a key element for the development of the so called lead market policy initiative, which aims to accelerate the emergence of innovative market areas through the close coordination of innovation policy instruments. The recent document on standardisation and innovation by the European Council (Council of the European Union, 2008) explicitly asks European standardisation bodies to be particularly vigilant when developing standards based on proprietary technologies, in order to allow broad access to all users, and emphasises the need to implement procedures designed to make intellectual property rights available under fair, reasonable and non-discriminatory conditions.

More specifically, the most relevant policy issues in this field pertain to the following aspects.

First, in defining policy recommendations, more emphasis should be devoted to the characteristics of the technology undergoing the standardisation process. In fact, following Lemley (2002), while standardisation can be beneficial in a wide variety of markets, it is worth distinguishing between two different types of standards: standards that define the technical features for interoperability in a network (e.g. in telecommunication devices, ICT equipment, etc.) and those that govern the quality or safety of a product.

In the first case, the fact that industry members rapidly agree on a standard leads to a positive impact in a market characterised by network externalities, even if the chosen standard is not the superior one from a technical point of view. Hence, in some cases it may be more important that an industry rapidly converges around a single standard to allow the diffusion of a technology or service eventually benefiting consumers. In the second case, where network externalities are not present the emergence of a suboptimal standard by a technical point of view turns to be more welfare detrimental.

Secondly, concerning the rules for the management of IPR through SSOs, it has emerged that the typical policy mandating that a royalty be fair, reasonable and non discriminatory (FRAND) gives little guidance for royalty determination, leaving room for potential *ex post* opportunistic behaviours. At the same time it is clear that while mandatory royalty-free licensing may provide a theoretical solution, such a change would obviously negatively affect innovation incentives and give rise to legal problems. Moreover, in the case of mandatory royalty-free licenses, formal standardisation bodies are expected to lose their attractiveness for innovative companies endowed with relevant patent portfolios, which will turn to the more flexible standardisation consortia (Blind et al., 2004; Chiao et al., 2007).

The difficulty for some smaller firms in joining the standardisation group and obtaining voting rights in the definition of the standard can lead to excessive market power for large incumbent companies. This calls for a constant monitoring of the activities of SSOs, with particular reference to their transparency in the rules for affiliation of members, the disclosure of relevant patents and the determination of royalties. Standard setting protocols have to promote the emergence of standardisation practises in which IPR do not negatively affect a proper balance between consumer welfare and innovation incentives for second generation and complementary products. The recent initiatives by the European Telecommunications Standards Institute (ETSI) for improvements in the transparency of their procedures represent an example of this type of approach. These provisions include the disclosure on the web of the list of the patent rights deemed to be relevant for each standard, the obligation for members to provide licenses under FRAND conditions, the availability of *ex ante* disclosure of licensing terms (ETSI, 2008). The latter is a voluntary mechanism to commit to licensing terms before the protected technology is selected and locked in as part of a standard. In particular, the *ex ante* disclosure of licensing terms can have a number of positive effects: it favours competition on the basis of technology and price before the standard is approved, it prevents the possibility of *ex post* monopoly pricing once lock-in has occurred and it allows prospective market entrants to calculate their expected entry costs after the standard is adopted. Such advantages clearly come at the cost of increasing the risk of anticompetitive behaviours (Swanson and Baumol, 2005), e.g. group discussions of disclosed licensing terms may lead to group boycott conduct (Meinhold, 2008).

Given the global dimension of technological markets, it is also key to support international institutions devoted to promote collaborations among regional SSOs. A relevant example of such an initiative is World Standards Cooperation (WSC): in 2007 the world's leading international standards organizations – the International Electrotechnical Commission (IEC), International Organization for Standardization (ISO) and International Telecommunication Union (ITU) – adopted a harmonised approach to addressing the inclusion of patented technology in standards (see <http://www.itu.int/ITU-T/ipr>).

Thirdly, the increasing diffusion of patent pools requires particular attention and a shared view on the methodologies applicable to identify the actual level of complementarity among patents included in the pool, so as to ensure that the pool is welfare enhancing. Although the concept of technological complementarity is likely to be highly sector specific, a significant effort should be put in the development of empirical tests and in their translation into clear guidelines.

Fourthly, the difficulty in identifying illegitimate forms of exploitation of patent rights calls for the need to support actions aiming at favouring collaborations among SSOs and patent offices. The potential contributions of patent offices may include providing services such as automatic updating of SSOs' IPR databases, carrying out patent searches on demand and advice on improving transparency through making the relevant information about uncertainty in specific areas of pending patents publicly available (see Karachalios, 2008).

Finally, as previously mentioned, a major concern in standard setting processes in recent years relates to the so called 'patent ambush', a strategic conduct consisting of not declaring the ownership of patents relevant to a standard in order to block it afterwards or to extract high royalties once the standard has already reached a high level of adoption. As witnessed by recent legal cases, this type of innovation detrimental strategic conduct has been punished in Europe as an abuse of dominant position. A recent study on standardisation in Information and Communication Technologies sponsored by the European Commission highlights the tradeoffs and the specific criticalities of interventions forcing firms to mandatory licensing in these cases (European Commission, 2007b). However, apart from specific cases, the issue in general still needs further assessment and the development of shared policy directions.

## 7 THE USE OF EXISTING PATENTS

### 7.1 Problématique

Patents can be used by the holder, other firms, public authorities and researchers for myriad purposes. Regarding the holder, patents can be used:

- to restrain the power of suppliers by owning key technology elements;
- to freeze a technology by preventing the development of a particular market or technology;
- to set up picket fences through reactive patent behaviour;
- to prevent others from acquiring IPR;
- to create a smoke screen by filing patent applications on technologies which will not be exploited, etc. (Guellec et al., 2007).

In particular, businesses have a variety of reasons for seeking patent protection, which can include:

- provisional protection of an innovation by holding pending applications;
- building monopoly position;
- blocking others from entering a market;
- assembling a portfolio of rights to create financial strength;
- getting a seat at the table when standards are being set;
- creating marketing messages and becoming more visible in a market;
- generating licence income;
- building a base for infringement claims;
- preventing lawsuits;
- measuring the performance of the company;
- communicating innovativeness to investors;
- avoiding the consequences of not patenting.

These reasons can be grouped into the following main motivations for patenting:

- commercial exploitation
- licensing
- cross-licensing
- prevention from imitation
- blocking competitors
- reputation.

While the uses of patents can be grouped as follows:

- internal
- licensing
- cross-licensing

- licensing and using
- blocking competitors
- not using (European Patent Office, 2007).

What use do firms make of their patents? Why are some patents exploited commercially, while others are licensed out to other firms, and still others are left unused? These are relevant issues, as the ability to translate new technologies into economically valuable goods or services is crucial for the competitiveness of firms, regions, and countries. Usually, information on the use and non-use of the patents is not available, especially for Europe and for cross-country and cross-sectoral studies.

The European Commission (2004) shows that at the overall EU-6 level:

- 50% of patents are used internally;
- 35% are not used – specifically, 18.7% are filed for strategic reasons and 17.4% are ‘sleeping’ patents;
- 15% of the patents are exchanged in the market for technologies, 6.4% are licensed, 4.0% are both licensed and used internally and 3.0% are used in cross-licensing agreements.

It is worth mentioning that these figures vary across countries, technologies, applicants and size. For instance, the share of unused patents is 18% in SMEs compared to 40% in large firms and universities.

With respect to firms other than the holder, patents can be used for inventing around or obtaining licences. Apart from that, patents can be used by ‘trolls’ for litigating patent infringements. As far as researchers are concerned, patents can be used for mapping the state of the art, technological forecasting etc. In particular, searching for a patent has become a frustrating and convoluted process because there is no streamlined and universal approach for searching patent documents at the various patent offices.

Regarding the effectiveness of IP protection mechanisms in the formation of research partnerships, patents are most frequently used to protect both background and foreground knowledge in partnerships. Existing IP titles are quite useful when negotiating new partnerships (Hertzfeld et al., 2006). Hall and Ziedonis (2001) underlined the use of patents as bargaining chips and as a means of avoiding hold-up problems.

## 7.2 What we already know

Patent accumulation concentrated in a few large firms may result in an increase in innovation over time because large firms may be better able to take advantage of economies of scale. Since R&D typically involves large fixed costs, which may include the creation of new patents and the use of existing patents, larger firms may be better equipped to appropriate knowledge through patent ownership. Larger firms may have better access to financing and may be better able to diversify their projects, more effectively decreasing their exposure to risk. Further, significant complementarities often exist among products sold by the same firm. Thus larger firms may have better knowledge of the demand and size of potential markets (Symeonidis, 1996).

On the other hand, if patent ownership is concentrated in the hands of very few firms, rival firms must subsequently licence technology from patent owners or invent around the original patented invention. Therefore sequential innovation costs for firms in general may rise if future inventions rely upon the previous work of others.

In answer to the questions of how SMEs make use of patents now, how SMEs expect to use them in future, and what problems SMEs encounter using the existing patent system, Eurochambers (2006) has said that the main problems relate to high costs, tedious, laborious and time-consuming procedures, language problems, ineffective and costly real protection of patent rights and non-uniformity of systems. As a result, SMEs do not make extensive use of patents. The situation is, however, expected to improve if an effective and cost efficient patent system is put in place in Europe.

Increasing competition provides the incentive for firms to become more mobile, moving to regions where labour costs are low, the regulatory burden less onerous and conditions negotiable. Consequently, companies are increasingly turning to international expansion and foreign direct investment (European Patent Office, 2007).

Foreign direct investment (FDI) is sensitive to international differences in IPR in sectors with knowledge-based assets. FDI representing complex but easily copied technologies is likely to increase with the strengthening of IPR, because patents increase the value of knowledge-based assets, which may be efficiently exploited through internalised organisation. To the extent that licensing costs come down with stronger IPR, FDI could be displaced over time by efficient licensing. Whatever the mode, the likelihood that the most advanced technologies will be transferred rises with strengthened IPR. Investment and technology transfer are relatively insensitive to international differences in IPR in sectors with old products and standardised, labour-intensive technologies. Here, FDI is influenced by factor costs, market sizes, trade costs and other location advantages (Maskus, 2000).

Royalties and licence fees are affected by the strength of patent regimes. IPR can underpin an efficient system of contracts to promote formal technology transfer through licensing. The potential increases in licensing volumes from strengthening such rights could be significant, and the quality of the technologies should rise. In this respect, technology importers will pay higher costs to absorb more and better technologies as a result of tighter IPR. Stronger IPR could also permit firms to choose not to license their closely held technologies except in cross-licensing or patent-pooling arrangements. Thus, a trade-off is likely to emerge between stronger licensing incentives and greater prerogatives to maintain technologies under close control (Yang and Maskus, 2001).

As to the records of licence agreements in Europe, it would be useful to provide all the relevant information on a unique database similar to the American one, which would help third parties in the preparation of strategies vis-à-vis licence requests. It would also ensure improved fluidity in the market for technology. In the United States, the federal securities laws require publicly-traded companies to disclose information on an ongoing basis. Examples of material contracts include licence agreements. The SEC's EDGAR database provides free public access to corporate information, allowing third parties to quickly research a company's financial information and operations by reviewing registration statements, prospectuses and periodic reports. Third parties can also find information about recent corporate events that a company does not have to disclose to investors (Securities and Exchange Commission, 2008).

### **7.3 What is new**

According to Chan (2008), it is unclear how firms are using their patent portfolios and whether an increase in portfolio size leads to an increase in firm innovation. For example, Lemley and Shapiro (2005) describe several uses of patents that do not directly lead to the development of a new product. Examples include obtaining financing, boosting market valuation, creating patent thickets, deterring others from suing, etc.

As far as patent search is concerned, the three main repositories of English-language patent documents — the EPO, the USPTO and WIPO — offer free databases with online search tools that all work differently, display different results, which require the user to enter numbers, dates and keywords in different formats, and which are displayed idiosyncratically (Nature Biotechnology 2006). Because searching and accessing patents in the free official online database is rather difficult, patent search firms provide user-friendly databases, such as Thomson-Reuters and Questel.

Different types of searches used by attorneys or agents help assess novelty, validity, infringement, clearance and state of the art. First, novelty searches are conducted prior to the filing of a patent application. The patentability search seeks to determine if anyone disclosed the invention concept in a publicly available work anywhere in the world before.

Second, validity searches (invalidity searches) are used to determine absolute novelty at the time of the invention. For this reason, a validity search may be thought of as an exhaustive patentability search that has been conducted after publication of the patent application or issuance of the patent. With this search, the claims are validated against all prior art.

Third, infringement searches are used to determine whether an enforceable patent already claims the same matter as the concept, unpatented invention, expired patents or mere publications. Accordingly, the document set for these searches consists only of unexpired (in-force) patents.

Fourth, clearance searches (right-to-use or freedom-to-operate searches) are used to determine whether a party has clearance to make, use and sell an inventive concept. Clearance is established when a patent has not been infringed or has otherwise expired.

Finally, 'state-of-the-art' searches are comprehensive searches of all available patent and non-patent literature to determine the direction of research activities (Hunt et al., 2007).

Patent databases contain a wealth of technical information, but only a fraction of innovative SMEs use them as an information source. In this respect, the probability of using patent databases increases with firm size and is higher among firms that perform R&D or use patents as an appropriation method. Furthermore, the use of patents as an important information source is correlated with the patent propensity rate in each industrial sector. Finally, SMEs mainly use patent databases to acquire information, often for legal purposes, which is not available from any other source. In contrast, these databases are seldom used to acquire technical data, largely because of the cost in terms of personnel time and expertise. This points to the need for simpler and more efficient methods of searching patent databases (Arundel and Steinmueller, 1998).

Once a European patent has been granted, it becomes a bundle of national patents governed by national laws. The International Patent Documentation Centre (INPADOC) is an international patent collection produced, maintained and updated by the EPO. The INPADOC database, which is publicly accessible, provides information about patent families, i.e. corresponding patent applications, in different countries which claim the same priority and which normally disclose the same invention. It also provides information concerning the legal status of patent applications and patents in those countries which report status changes. Consequently, third parties can access INPADOC in order to know the status of the different national patents.

## 7.4 Policy implications

Full-text English language records of patent documents are available at the EPO, USPTO and WIPO, which have English-language titles and claims, and sometimes are written in full-text English. The primary challenge presented by full-text searching is constructing useful search queries using foreign language keywords. The next obstacle in full-text searching is interpreting non-English language results or hits. As to peculiar issues to certain technological fields, the patent offices have experienced a rapid expansion in the number of biotechnology-related applications. Often, developing comprehensive lists of synonyms can take significant research. Biotechnology synonyms are usually not intuitively apparent (Hunt et al., 2007).

For answering the question as to what extent and for what purpose do innovative firms use patents, surveys show that patents should be considered as one component in the appropriation strategy of firms, and often not the most important one (Guellec, 2007). To the question of whether or not patents add value to innovation, Arora et al. (2003) find that for most innovations the patent premium should be negative, which is the reason why so many innovations are not patented and for those which are actually patented the patent premium is significant and has a skewed distribution. To the question whether or not patents induce further R&D and innovation, Arora et al. (2003) find that patents have a positive impact on R&D expenditure in certain industries.

In particular, patents are used for securing return from inventions in certain industries. The share of product innovations which are patented is very high for pharmaceuticals, chemicals, machinery, office and computer equipment, and precision instruments but very low for transport and telecommunication services, transport equipment, basic metals, and textile and clothing. Further, patents are more effective for product innovations than for process innovations because processes are not as easily accessible to competitors as products (Arundel and Kabla, 1998). In addition, patents are more often used for protecting radical innovations, based on R&D, than for protecting more marginal inventions based on other means (Licht and Zolz, 1998).

Finally, the use of patents by research centres and universities is very limited, resulting in a lack of incentives and financing for research, as well as a poor record for licensing and transferring technology and knowledge to industry. The latest European innovation scoreboard listed only five European countries as innovation leaders. This shows that patenting issues remain insufficiently addressed (Pompidou, 2007).

There is much more potential for building on the existing EPC system by voluntary measures such as EPLA and the London Protocol and adding some measures that really help universities, such as the grace period and flexible provisional systems. The excessive costs of patenting in Europe come to a large extent from the maintenance of national patent systems with no significant benefits. These resources could be used more effectively to support the innovation process. In other words, it is encouraged that more Member States progressively abandon their national systems and rely on the European patent only. The other advantage of this approach is that it does not require unanimity of the member states and should be easier to implement. If the member states are really serious about opening the way to a community patent system, they should not object to this. It requires political courage and the capability of admitting that a good idea 20 years ago may no longer be a good idea today (Capart, 2006).

## 8 PATENTS AND COMPETITION

### 8.1 Problématique

Innovators are motivated by high expected profits, which are increased by a monopolistic position. On the other hand, companies with a solid monopolistic position tend not to be motivated to innovate as that would not significantly increase their already substantial profit margin. The threat or reality of competition forces incumbents to innovate, while for newcomers innovation is their ticket to enter the market (Encaoua and Ulph, 2000).

A patent is the right to exclude competitors. A patent has direct anti-competitive effects as a product will have a higher price if it embodies a patented technology due to market power conferred by the patent. Nonetheless, competition will be induced by follow-up inventions in a dynamic process. In fast-moving technological areas, the monopoly position possibly provided by successful innovation is only temporary as new inventions arrive quickly, with superior technology taking over the market and leapfrogging incumbents. In this cycle, patents play the role of strengthening the market power that accrues to the successful inventor, hence reinforcing the incentive to innovate *ex ante*, but possibly weakening the incentive to innovate for the winner, at least *ex post* (Guellec et al., 2007).

According to Duxbury and Tuck (2009), a more recent factor affecting pharmaceutical companies' patenting and protection strategies is the European Commission's stance on antitrust law in an IP context. The AstraZeneca decision (Commission Decision of 2005: Case COMP/37.507: Generics/AstraZeneca) together with the Commission's continuing sector inquiry have left the industry facing a great deal of uncertainty over what it will be permissible for a company to carry out in its IP and commercial strategy, particularly when in a dominant position. The Commission's definition of the market in the AstraZeneca case seems to unfairly penalise the innovative company by creating a structure where the innovator that is the first to market with a new class of drugs will inevitably hold a dominant position (Wragge and Co., 2008).

The preliminary results of the sector inquiry (European Commission, 2008a) show that market entry of generic companies and the development of new and more affordable medicines is sometimes blocked or delayed, at significant cost to healthcare systems, consumers and taxpayers. Citing a sample of medicines that faced patent expiration in the period 2000 to 2007 in 17 Member States, the European Commission report suggested that additional savings of around €3 billion would have been possible on that sample over this period if generic medicines had entered the market without delay. For the same samples over the said period total savings gained by generic entry amounted to at least €14 billion, the report added. Defining originator companies as the ones that develop and sell new medicines, the report found that these companies used a variety of methods to delay or block the market entry of not only generic companies but also other originator competitors. On the practices that the originator drug companies use to delay or block market entry of competing medicines, the European Commission listed among others: multiple patent applications for the same medicine (so called patent clusters,) initiation of disputes and litigation, conclusion of patent settlements which constrain market entry of generic companies and interventions before national authorities when generic companies ask for regulatory approvals (Singh, 2008).

## 8.2 What we already know

As far as the legal architecture is concerned, the antitrust area covers two prohibition rules set out in the EC Treaty. First, agreements between two or more firms which restrict competition are prohibited by Article 81 of the EC Treaty, subject to some limited exceptions. Second, firms in a dominant position may not abuse that position (Article 82 of the EC Treaty). The European Commission is empowered by the EC Treaty to apply these prohibition rules and enjoys a number of investigative powers to that end (e.g. inspection in business and non-business premises, written requests for information etc). It may also impose fines on undertakings which violate EU antitrust rules. All national competition authorities are also empowered to apply fully the provisions of the Treaty in order to ensure that competition is not distorted or restricted. National courts may also apply these prohibitions so as to protect the individual rights conferred to citizens by the EC Treaty.

From the perspective of economics, there is a direct relationship between the sales of innovative products and market structure and, implicitly, the average size of firms in a specific branch. According to the product life cycle, there are many small firms that compete in the first stages of technological development on design, and on combinations of product and market. In this situation, the market structure manifests a low seller concentration. Later in the cycle, when a specific combination of product and market dominates technological development, and when consumers are more inclined towards a particular design, firms have to abandon their unsuccessful product-market combinations in favour of a more successful competing design. Once a dominant design has been established, firms will start to compete on price, and economies of scale become an important determinant in order to survive, which can lead to start of an oligopolistic shake out.

Many firms that fail to achieve a minimum efficient production scale must sooner or later leave the market, which results in a market dominated by a few large firms competing on price (Klepper, 1996). Nevertheless, firms facing Bertrand competition possess a strong incentive to increase their profit margin through product differentiation, and will therefore reap more sales from new products if their products succeed in time (Martin, 1993; Kaniowski, 2005). Small firms, in turn, possess a strong incentive to introduce new products into the market in order to survive competition with current firms. Large firms have an incentive to invest in both process (economies of scale) and product innovation (economies of scope) in order to maintain their market position (Cohen and Klepper, 1996). Aghion et al. (2005) show that an inverted U-shaped relationship between competition and innovation is a good fit, which challenges both empirical and theoretical findings in the traditional literature.

A patent rewards an invention, a new technology, which sometimes results in the creation of a new market. In that case, the effect of patents from the time period without the protected invention to the time period with the protected invention is not to restrict competition on markets already existing in the previous period of time, but to create a new market (possibly monopolised, but still better than no market at all). Second, patents offer a substitute to secrecy and involve disclosure, hence they encourage further innovation (i.e. competition of new products against existing ones). Third, patents can serve the creation of new companies by protecting them from competitive strategies based on incumbency, such as size, brand or sunk costs (Guellec et al., 2007).

Firms tend to patent more of their inventions when they are confronted with more intense competition. Weaker competition, due to regulation or high entry cost, provides protection other than IPR to the innovations of the incumbents, which then have little reason to incur the cost of filing IPR and disclosing their technology. However, as patents in turn reduce *ex post* the degree of competition on a market, it is difficult to observe correlation between patenting and competition at the market equilibrium (Guellec, 2007).

### 8.3 What is new

In knowledge-intensive industries, competition is based less on prices and current market share and more on new products and technologies and future market share. The market power criterion is more fragile as the state of play can be reshuffled by new technologies. Substitute products are not the current competitors but the ones that will be on the market in the future (Encaoua and Hollander, 2004).

Reitzig (2004) shows that multiple patents per invention are filed in both discrete and complex technologies. In selected discrete technologies, patent fences may serve to exclude competitors whereas in complex technologies, patent thickets represent exchange forums for complementary technology. The results expand on traditional views of profitable patent exploitation across industries, which suggest that different legislative issues arise from multiple patenting per innovation in complex and discrete technologies depending on the degree of technological complementarity. The results have unexpected policy implications in that they illustrate how patentees could eliminate competition in the form of substitute technologies through fencing.

In one case of the European Commission pharmaceutical sector inquiry, 1300 EU-wide patents (patent clusters) were filed for a single medicine. The inquiry pointed out that nearly 700 cases of reported patent litigation with generic companies were filed. Although the generic companies won some of these cases, there were many settlement agreements for ending an ongoing litigation or dispute. These specific settlements limited the entry to the market of the generic medicines and provided for payments from the originator to the generic companies. Moreover, the report found strangulation of innovation, as some originator companies used defensive patenting strategies, thus obstructing the path of innovation from competing pharmaceutical companies and delaying consumers' access to innovative medicines (Singh, 2008).

Roox et al. (2008) depict the key areas in which the patent system and the legal and regulatory framework fail to ensure an appropriate balance between incentives and competition, such as failings in the system for granting quality patents, patent thickets and follow-up patents, patent litigation procedures and other patent-related barriers. First of all, failings in the system for granting quality patents include: a lack of rigorous assessment of the patentability requirements, in particular of the inventive step, lack of quality of applications, examiners' inability to check data presented to them, not enough consideration of third-party observation by examiners and weaknesses in the opposition procedure. Second, patent thickets and follow-up patents include unjustifiable extension of the monopoly through follow-up patents, multiple divisional patent applications that are entirely identical to the parent specifying data without linking it to the claims, second and subsequent use claims, and genuine incremental innovation compared to simple changes. Third, patent litigation procedures include the complexity and unpredictability of litigation across the EU and improper granting of interim injunctions. Finally, other patent-related barriers cover patent linkage, statements to authorities, shifting consumer demand with marketing campaigns and supplementary protection certificates granted on the basis of incorrect information.

## 8.4 Policy implications

Patents can be used in anti-competitive strategies, whose aim is to exclude other companies (competitors) from the market. In that context, patents are not just means to exclude competitors, they are instruments used by incumbent firms to raise entry barriers. Patents are also used by new entrants to penetrate markets. Patents are used in standard setting processes and for making alliances. This diversified role of patents renders their effect on competition more complex. Some anti-competitive strategies are clearly illegal, others are abuses of the system, permitting an undue extension of the exclusive right beyond the one granted by the patent office. These practices can be deterred, and often are, by a close monitoring by competition authorities. A question raised to patent offices is to what extent could such practices be hampered upstream, by granting patents which would not facilitate, or would even hamper them? Could patent law and practice tackle some of these problems? (Guellec et al., 2007).

Pharmaceutical companies enjoy patent protection for their products. Once the patent has expired, producers of similar generic products can enter the market. Pharmaceutical companies that try to prolong patent protection for a product may breach EU competition rules. Such behaviour can also have the side effect of removing incentives to innovate, as competition from generic products encourages the creation of new products. In this respect, AstraZeneca had abused the patent system and the system for authorisation of medicines with the aim of delaying competition to a blockbuster drug from generic and parallel imported pharmaceuticals. AstraZeneca was fined €60 million. The appeal is currently pending before the Court of First Instance. As a result of this first case, the Commission intensified the monitoring of competition in the sector of generic medicines. The first findings indicate that competition in the market for human medicines may not be working well in Europe; fewer new medicines are being brought to market and the entry of generic medicines sometimes seems to be delayed. The Commission has therefore opened a sector inquiry to investigate the reasons for this (European Commission, 2009).

There is a need for the proper balance between the patent-related contracts and their impact on competition. The patent uses have been watched by competition authorities. Patent licences can be used for sharing markets by the inclusion of territorial exclusivity, or fixing prices even indirectly. Cross-licences can be regarded as tools for collusion and as barriers to entry. Patent pools are subject to regulatory clearance because they could result in a monopoly. The multiplicity of patents over a single area, with royalty-stacking, can cost so much that it might hamper innovation. The large number of patent holders might result in 'the tragedy of anti-commons', chronic under-use of patented resources.

Alternatives to competition and patents are Open Source, open science, open access, open innovation and open standards. Open Source projects are based on collaborative innovation and are characterised by a non-proprietary setting. Open science offers free collaboration and rapid public disclosure of results with no restrictions on use other than acknowledging the source. Open access provides users free reading, downloading, copying, distributing, printing, searching or linking. Open innovation prioritises partnering, licensing and venturing to combine internal and external sources of ideas and technologies. Open standards are publicly available specifications which give a common method of achieving a particular goal (European Patent Office, 2007).

The financial institutions have devised various tools for patent holders to obtain monetary value from their patents more promptly than collecting royalties from licences. These mechanisms include securitisation based on anticipated royalty income streams, auction of patents, patent collateralisation, patent sale-lease-back arrangement, and patent litigation insurance.

## 9 CONFERENCE

The topics dealt in this study were presented in a conference. As the first step in the current project, and in view of the results of the previous project, STOA organised a conference with the goal of reviewing issues related to the current status of governance of the European patent system. One important aim was to work towards building a discussion platform and a resource for further policy actions linking MEPs from different committees with stakeholders in order to improve decision making on IPR-related issues.

The conference was held in the European Parliament premises in Brussels, Belgium, on 17 March 2009. Registration was open at <http://www.onetec.be/meetbridge/index.asp?id=2587> until 6 March 2009.

Candidate speakers were approached for availability based upon an initial draft programme. The European Parliament issued formal invitations to speakers based on confirmation. Invitation letters for speakers, MEPs and audience were drafted. A poster for internal use was designed. An online registration form and ad-hoc email address were created and made operational due to the capacity of the room. A preliminary list of attendees was drafted. Dissemination of the event to invitees took place as soon all the speakers were confirmed.

In the conference, we aimed to provide the audience with a clear idea of the achievements and of the follow-up which will go forward afterwards. In this respect, the following points were used to frame the speech of speakers:

- legislative proposals from the European Commission and Council working group regarding different aspects of patents covering relevant issues;
- why these issues are important or not (arguments with figures if possible);
- the need to point towards certain policy options; what needs to be solved in what timeframe.

The slides of the presentations are available at [http://www.europarl.europa.eu/stoa/events/workshop/20090317/default\\_en.htm](http://www.europarl.europa.eu/stoa/events/workshop/20090317/default_en.htm)

A Draft Report was prepared as a background paper for the conference. That paper and the input from the conference have contributed to the formulation of this Final Report. This study aims at providing a balanced view on how important these problems are and why. The topics of this study follow.

The backlog issue: Over the last decade, the time for getting a patent, as well as the related backlog of patents has risen considerably. The consequence of this is an increase of legal uncertainty.

Patent enforcement: While European legislators are still negotiating a European Union (EU) Patent Litigation System which should handle disputes relating to both existing European Patents and Future Community Patents, small and medium size enterprises (SMEs) already encounter difficulties in enforcing their rights before national jurisdictions.

Regional dimension of IPR in Europe: The EU's Regional Policy is more and more associated with the achievement of the Lisbon Strategy, which aims at building up Europe as a world leader in the field of the 'Knowledge Based Economy.' Consequently, the funds made available for achieving this goal, which come under the competitiveness programmes, have dramatically increased over the past few years.

Patent and standardisation: In an information and communication technology (ICT) oriented world, standards are a key driver for innovation. However, co-existence with patents raises some questions. What could be the interface between ICT standardisation policy, IPR and competition law? What could be the balance between IPR, interoperability and competitiveness? How to ensure a correct balance between the interests of licensees and licensors and the transparency of licensing? How to identify relevant IPR in connection with standards?

The use of existing patents: Third Parties have access to relevant information relating to European patent applications via free access websites. However, once the European patent has been granted, it becomes a bundle of national patents governed by national laws.

Patent and competition: In the past few decades, the European Court of Justice has made the legal distinction between the existence and the exercise of IPR. While the first is not challenged per se, the second one has to comply with competition rules.

## 9.1 Conference programme

8.00	8.30	WP8	Check-in		Entrance Rue Wiertz 60, Brussels
9.00	9.15		Welcome and opening remarks		<p><b>Philippe Busquin</b> MEP Chairman of STOA EUROPEAN PARLIAMENT</p> <p><b>Wim Van der Eijk</b> Vice-President EUROPEAN PATENT OFFICE</p>
9.15	9.30	WP8	Current policy issues in the governance of the European patent system		<p><b>Ove Granstrand</b> Chalmers University ETEPS</p>
9.30	10.30	WP8	European Patent Court and Community Patent	Rapporteur: Dr Jos Leijten (ETEPS)	<p><b>Leonidas Karamountzos</b> Council Secretariat COUNCIL OF THE EU</p> <p><b>Oliver Varhelyi</b> Head of Unit IP DG Internal Market &amp; Services EUROPEAN COMMISSION</p>
10.30	11.00	<b>Break</b>			
11.00	12.00	WP3	Patent enforcement	Rapporteur: Dr Giuseppe Scellato (Rosselli Foundation)	<p><b>John Taylor</b> Risk Management, Security and Specific Controls</p>

					<p>DG Taxation and Customs Union EUROPEAN COMMISSION</p> <p><b>Patrick Ravillard</b> ACTA negotiations DG Trade EUROPEAN COMMISSION</p>
12.00	12.30	WP4	<p>Regional dimension of IPR in Europe: Knowledge based economy, innovation and IPR</p>	<p>Rapporteur: Dr Bianca Poti' (CNR)</p>	<p><b>Thierry Sueur</b> Vice-President European and International Affairs Air Liquide BUSINESSEUROPE</p> <p><b>Stéphane Drouin</b> Head of European Patent Department PFIZER – EFPIA</p>
12.30	14.30	<b>Break</b>			
14.30	15.00	WP1	The backlog issue	<p>Rapporteur: Dr Jos Leijten (ETEPS)</p>	<p><b>Wim Van der Eijk</b> Vice-President EUROPEAN PATENT OFFICE</p>
15.00	15.30	WP6	The use of existing patents	<p>Rapporteur: Dr Jos Leijten (ETEPS)</p>	<p><b>Guus Broesterhuizen</b> President NETHERLANDS PATENT OFFICE</p>

15.30	16.00	WP5	Patent and standardisation	Rapporteur: Dr Giuseppe Scellato (Rosselli Foundation)	<b>Thomas Kramler</b> Case Handler, Unit Antitrust: IT, Internet & Consumer Electronics DG Competition EUROPEAN COMMISSION
16.00	16.30	WP7	Patent and competition	Rapporteur: Dr Victor Rodriguez (TNO)	<b>Filip Borkowski</b> Inquiry into the Pharmaceutical Sector DG Competition EUROPEAN COMMISSION
16.30	17.45	WP2	<i>Round table discussion</i> The enhancement of patent awareness within the European Parliament	Moderator: Prof Ove Granstrand (Chalmers)  Rapporteur: Dr Bianca Poti' (CNR)	<b>Karsten Meinhold</b> Director Industry and Public Relations SIEMENS-NOKIA NETWORKS  <b>Greg Perry</b> Director General EUROPEAN GENERIC MEDICINES ASSOCIATION  <b>Maria Cimaglia</b> Legal Affairs EUROPEAN ASSOCIATION OF CRAFT, SMALL AND MEDIUM-SIZED ENTERPRISES  <b>Pierre Brisson</b> Chairman of the Board PROTON EUROPE

					<p><b>Marc Ledoux</b>                  Director of Industrial Policy                  CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE</p> <p><b>Josef Kratochvil</b>                  Vice-President                  CZECH INDUSTRIAL PROPERTY OFFICE</p> <p><b>Tim Frain</b>                  Director IPR Regulatory Affairs                  NOKIA CORPORATION</p>
17.45	18.00		<i>Closing remarks</i>		<p><b>Wim Van der Eijk</b>                  Vice-President                  EUROPEAN PATENT OFFICE</p>

*N.B.*

Interpretation services available between 9.00 and 12.30 C.E.T. and between 15.00 and 18.00 C.E.T.

Due to security reasons, the check-in start at 8.00 and close at 8.30 C.E.T.

## 10 FINAL REMARKS

A Draft Report was prepared as a background paper for the conference organised by STOA on current policy issues in the governance of the European patent system. That paper and the input from the conference speakers and attendants have contributed to the formulation of this Final Report. The current study covered current policy issues in the governance of the European patent system, such as the backlog problem, the enhancement of patent awareness within the European Parliament, patent enforcement, the regional dimension of intellectual property in Europe, patents and standardisation, the use of existing patents, and patents and competition.

It is worth mentioning that the conference contributed to the discussion of the multi-level governance issues with stakeholders from European to national patent offices, from private to public sector actors. As a result of the conference, it was stated the need for an IP strategy for Europe.

First, an increase in the size of the workload of the European Patent Office has been observed due to a rise in the number of patent applications, which brings up a critical workload and quality issue, known as the backlog issue. Much has been written about the factors which partly explain the increase in patent applications, such as the filing route, the sector, the geographical origin of patents, the firm's experience in patenting, the number of inventors and international patent classes. Recently, the Administrative Council was recommended to: utilise work carried out by other patent offices, applicants and third parties; to raise the bar for patent granting; to improve efficiency; to boost cooperation; and to improve the ability to deal with new challenges, and reviewing governance and finance issues. As far as the future is concerned, the Administrative Council Survey considers three scenarios and anticipates that except in a scenario of extreme growth, the programme of recruitment, building and training will more than cope with the demand.

Second, a well-functioning and legitimate patent system is of uppermost importance for a knowledge-based economy. It sustains research and development, innovation, market penetration and welfare and it requires a strategy. Improvement of the European patent system requires strengthening the role and expertise of the European Parliament in patent-related issues and accommodating the rise of public concern for patent matters. Complexity, extension and changes of the European patent system are among the reasons for improving the awareness of Members of the European Parliament (MEPs). There are two critical aspects: the inherent expansionist drive and the fact that innovation has to be qualified in terms of efficiency, sustainability and social desirability. A strategy does not mean a stronger intellectual property rights regime, but a balanced system, capable of matching different stakeholders' interests. Effectiveness and legitimacy of the intellectual property systems are currently under scrutiny. The overall success of the governance of the European patent system could be better assured by creating a diversified set of formal and informal mechanisms of legitimacy, expanding or creating new forums for dialogue with a wider range of representation, combining expert and non experts and opening the learning process.

Third, a number of recent studies have highlighted an increase in patent disputes both in Europe and the United States, showing how the threat of being involved in a costly and uncertain infringement case, as well as the risk of retaliation, can negatively affect ex-ante research and development incentives, particularly for less financially endowed companies.

Available data on infringement cases suggest that more valuable patents are more likely to be sued. The policy action for the enhancement of patent enforceability within the European patent system has to face a relevant constraint which relates to the absence of a unified jurisdiction for handling patent infringement cases. The analysis of patent litigation costs in Europe highlights an elevated cross-country variance and suggests that the introduction of a unified jurisdiction will lead to an increase in expected litigation costs only for those patentees that are now extending their rights to a very limited number of member states. While patent litigation insurance has long been considered a potentially powerful tool for ensuring access to the patent system for small and medium-sized enterprises (SMEs), public support of the creation and development of an insurance market for the coverage of litigation costs does not seem to be an effective policy option. Public support for the diffusion of alternative forms of dispute resolution based on arbitration might contribute to enhance patent enforceability among innovative European firms.

Fourth, the biggest challenges in many European countries in this respect is on the demand side, since often business are not research intensive or, in the case of SMEs, are not aware enough of the role of IPR in their innovation and growth, and are frightened by the IP costs. The European Commission has stressed the importance of a regional system based policy that is more oriented towards SMEs and can play a key role in promoting knowledge transfer from academic institutions to local industrial users. Regional policy actions receiving attention in this area include the support of the creation of new knowledge-based firms and the support of a greater awareness of patents' role for private and social benefits (IP awareness programmes). Moreover knowledge transfer is an important complement to the intellectual property rights management within public research organisations and it is needed to assure the circulation of research results as well as intellectual assets exploitation. The specific local/regional role is seen as supporting an intellectual property collaborative model as alternative to a university and public research licence model. Some problematic aspects may be nevertheless underlined. University are relatively low oriented towards local systems on one side and regional contexts are positioned very differently with reference to newly emerging technologies, existing industrial capacities, knowledge and human resources basis. The regional selective environment could provide mechanisms for integration and innovation, but enhancing some direction can have the cost of blocking innovation into other frameworks. A more differentiated academic system can help a better integration with local industrial users, while regions can develop also more open interregional policies.

Fifth, standardisation is an important enabler of innovation and the current standardisation models in Europe have to face new challenges generated by accelerated market cycles, the convergence in technologies and the increasing impact of intellectual property rights. A two-fold relationship exists between patents and standards: Firstly, the strategic exploitation of patents can prevent the creation of standards that would otherwise be socially desirable, and secondly, standards can excessively weaken or reinforce the market power provided by patents. Such a situation calls for policy interventions that properly balance the interests of the patentees and the need to guarantee a rapid diffusion of new technological standards. There is the need for an effective monitoring of the activities of standard setting organisations with particular reference to their transparency in the rules for affiliation of members, the disclosure of relevant patents and for the determination of royalties. Moreover, the increasing use of patent pools requires particular attention, as well as a shared view on the methodologies applicable to identifying the level of complementarity among patents included in the pool in order to ensure that the pool is welfare enhancing.

A major concern in standard setting processes relates to strategic conduct by firms that do not declare their ownership of patents essential to a standard in order to block it afterwards or to extract high royalties. While this type of behaviour, being detrimental to innovation, has been punished in Europe as an abuse of dominant position, the matter still needs further assessment and the development of shared policy orientations.

Sixth, patents can be used for myriad purposes. Several uses of patents do not directly lead to the development of a new product, such as obtaining financing, boosting market valuation, creating patent thickets and deterring others from suing. In answering the questions as to what extent and for what purpose do innovative firms use patents, surveys show that patents should be considered as one component in the appropriation strategy of firms, and often not the most important one. Due to high costs, tedious, laborious and time-consuming procedures, language problems, ineffective and costly real protection of patent rights, and non-uniformity of systems, SMEs do not make extensive use of patents. The situation is, however, expected to improve if an effective and cost-effective patent system is put in place in Europe.

Finally, patents play the role of strengthening the market power that accrues to the successful inventor, hence reinforcing the incentive to innovate *ex ante*, but possibly weakening the incentive to innovate for the winner, at least *ex post*. Key areas in which the patent system and the legal and regulatory framework fail to ensure an appropriate balance between incentives and competition include failings in the system for granting quality patents, patent thickets and follow-up patents, patent litigation procedures and other patent-related barriers. The use of patents has been looked into by competition authorities, such as the European Commission in its investigations of the pharmaceutical sector. The financial institutions have devised various tools for patent holders which might need further observation by regulatory authorities.

Lastly, STOA organised an IPR workshop during the Innovation Summit at the European Parliament in October 2009 in order to continue the IPR discussion.

## 11 ACRONYMS

ADR	alternative dispute resolution
ECJ	European Court of Justice
EPC	European Patent Convention
EPLA	European Patent Litigation Agreement
EPO	European Patent Office
ERA	European Research Area
EU	European Union
GSM	Global System for Mobile communications
HEIs	Higher Education Institutions
ICT	information and communication technology
IP	intellectual property
IPR	intellectual property rights
JPO	Japan Patent Office
KT	knowledge transfer
MEP	Member of the European Parliament
NPM	New Public Management
PCT	Patent Cooperation Treaty
PRO	public research organisation
R&D	research and development
RAND	reasonable-and-non-discriminatory
SACEPO	Standing Advisory Committee before the European Patent Office
S&T	science and technology
SIPO	State Intellectual Property Office of China
SME	small and medium sized enterprise
SPLT	Substantive Patent Law Treaty
SSO	standard setting organisation
STOA	Scientific Technology Options Assessment
TLO	technology licensing office
USPTO	United States Patent Office
WIPO	World Intellectual Property Organisation
WSC	World Standards Cooperation

## 12 GLOSSARY

**allowance rate:** number of applications that were granted during the reporting period, divided by the number of disposals in the reporting period.

**cross-licence:** a contract by which two or more parties grant to each other access to some of their patents.

**defensive patent:** patent to provide protection from litigation by allowing the holder to counter-sue or by preventing others from applying for the same or similar patent.

**essential patent:** patent which discloses and claims one or more inventions that are required to practice a given industry standard.

**invent around:** invent an alternative to a patented invention that does not infringe the patent's claims.

**number of disposals:** applications granted plus those abandoned or refused.

**patent ambush:** situation in which when a member of a standard setting organisation withholds information, during participation in development and setting a standard, about a patent that the member owns, has pending, or intends to file, which is relevant to the standard, and subsequently the company asserts that a patent is infringed by use of the standard as adopted.

**patent clusters:** see patent thicket.

**patent floods:** see patent thicket.

**patent pool:** agreement between two or more patent owners to licence one or more of their patents as a package to one another, and to third parties willing to pay the associated royalties.

**patent thicket:** dense web of overlapping intellectual property rights.

**patent troll:** person or company that enforces its patents against one or more alleged infringers often with no intention to manufacture or market the patented invention.

**picket fence:** competitor's strategy to contain the utility of another company's key patents.

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