



# Patents and Standards

A modern framework for IPR-based  
standardization

## Executive Summary

A study prepared for the European  
Commission Directorate-General for  
Enterprise and Industry

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as part of

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# Executive Summary

## Introductory remarks

### Context of the study

Efficient licensing of intellectual property rights (IPR) is crucial for achieving broad and rapid diffusion of innovation. To ensure that Europe is well positioned in today's global competitive environment, unnecessary barriers in the market for IPR licensing need thus to be removed. This requires a successful balancing of the incentives to invest in innovation against the benefits for the economy at large of a wide diffusion of knowledge. Of special interest in this context is the licensing of patents on technologies that are included in standards as an efficient licensing of these patents is key to the success of the standard. The licensing of such standard essential patents (SEPs) is however prone to market failures such as externalities (positive and negative), information problems, market power and free-riding. The various forms of market failure can result in barriers obstructing the efficient licensing of SEPs and can thus hinder the realization of the economic and societal benefits of the affected standards.

### Topic and objective of the study

The principle objective of this study is to collect quantitative and qualitative data on IPR-based standardization, with a focus on identifying barriers for efficient licensing of SEPs and on possible solutions to these barriers. The analysis is based on a review of the IPR and standardization framework in four industries: communication technology, consumer electronics, automotive and smart grids. The study identifies a range of options to lower barriers to SEP licensing and assesses these in terms of costs, benefits, and effectiveness. This report should aid the European Commission in its attempts to improve the European governance of SEP licensing arrangements. It can also be useful in the (ongoing) work of standard setting organizations on their IPR policies and rules.

### Methodology and added value of the study

The study draws on the existing literature and previous studies. A total of 37 interviews with practitioners have been performed to gather quantitative and qualitative insights into pertinent aspects. The study also draws on the OEIDD database of SEP disclosures to generate quantitative insights into *inter alia* the rate of SEP disclosure, types of disclosures, patent pools, ownership transfers and SEP litigation.

Much of the existing research on SEP licensing focuses on the telecommunication industry. The present study aims to go beyond this traditional focus and covers three additional industries (consumer electronics, automotive and smart grids) chosen for their reliance on standards that may include patented technologies and for their complementarity to the telecommunication industry. The study is broader than some of the existing research, notably the previous study commissioned by the EC<sup>1</sup>, in its examination of a full range of possible improvements to the current rules governing patent-based standardization. In the search for possible improvements it reviews ideas discussed among stakeholders and also adds an 'out-of-the-box' exercise by taking on board the experiences and lessons learned from other industries.

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<sup>1</sup> Knut Blind et. al., Study on the interplay between standards and intellectual property rights (IPR), 2011.

## Innovation, standardisation, patenting and licencing

### Innovation driven by patenting, licensing and standardization

Patent protection drives innovation by incentivizing investment in R&D. Patent protection allows the innovator to receive return on his investment by using the innovation himself or by licensing the patent to other companies. Standardization drives innovation by establishing interoperability between products and by facilitating market adoption of innovative technologies. Licensing and standardization are forms of collaboration. To get maximum benefits for society they may need to overcome potential market failures, such as information asymmetry, market power and externalities.

In Europe, patents are granted by national patent offices and the European Patent Office (EPO). Once a minimum of 13 EU countries ratify the Agreement on a Unified Patent Court, the EPO will be able to grant patents with direct validity in all participating countries. Standards are developed in formal Standard Setting Organisations (SSOs) as well as in less-formal fora and consortia. Among the formal standardization bodies are the three European SSOs, that is the European Committee for Standardization (CEN), the European Committee for Electrotechnical Standardization (CENELEC) and the European Telecommunication Standards Institute (ETSI).

European SSOs are governed by the EU acquis and are regularly mandated by the European Commission to produce certain standards known as European Norms (ENs). All standardization bodies have to comply with competition law. In particular, the Guidelines on Horizontal Co-operation Agreements comprise specific guidance for standardization<sup>2</sup>.

### IPR policies of standard setting organizations

Most standard setting bodies have adopted written policies to govern situations where standards comprise patent-protected technologies. In such situations, efficient licensing of the related patents is a precondition to the success of the standard. IPR policies aim at efficient SEP licensing and usually comprise both disclosure and licensing commitments.

Disclosure rules specify under which conditions members or participants of the SSO are required to inform the organisation that it owns IPRs that are essential to the standard, or may become essential when the final standards text is adopted. Licensing commitments ensure that licenses for patents with essential claims are available to all implementers, or that these patents will not be asserted against implementers of a standards-compliant product.

The most common licensing commitment is a commitment to license on fair, reasonable and non-discriminatory (FRAND) terms. The current IPR policies of SSOs leave the specification of what constitutes FRAND to bilateral negotiation and the Courts.

### Four industries with IPR-based standardization

The study examines the standardization and licensing practices in four industries in which standardization plays an important role and in which standards comprise patented technologies: telecommunication, consumer electronics, automotive and electricity. These industries have been chosen to be complementary in terms of starting point as well as allowing to capture the trend of

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<sup>2</sup> Commission Notice 2011/C 11/01.

technological development and convergence. The industry-specific analysis underpins the subsequent horizontal analysis of barriers and solutions.

#### **Telecommunication industry (mobile telephony)**

The area of mobile telecommunication (including mobile data) is the industry where the issue of patent-based standardization is most prominent. This is driven by heavy industry reliance on standardization (notably the main 2G (GSM), 3G (UMTS) and 4G (LTE) standards, but also WIFI standards) which comprises a great number of R&D intensive innovations protected by patents. New entrants have displaced the traditional device makers, which has resulted in a divergence between patent ownership and standard implementation. The traditional practice of cross-licenses of SEPs between vertically integrated companies thus corresponds less and less to industry needs and the new business practices of monetizing SEPs directly or indirectly by sale put IPR rules of the relevant SSOs (ETSI, IETF, IEEE) to the test. Difficult SEP-licensing negotiations and resulting litigation seem widespread.

#### **Consumer electronics industry (video and audio recording and reproduction)**

Standardization in the consumer electronics industry is mainly done in consortia. Standards for video and audio recording and reproduction (such as MP3 for music, JPEG for photo, H.264 for video) often compete against each other and the success of the standard in this competition is an important driver behind the strategies of the companies involved. Patent pools are a common tool to organize the licensing of standard related patents.

#### **Automotive industry (smart mobility)**

The automotive industry is highly standards-based, with standards being developed in ISO, ETSI and SAE International. In the smart dimension of the industry, there are a number of competing standards such as in car entertainment platforms. A range of new players has emerged in the "smart dimension" of the automotive industry. Investment in R&D into the "smart dimension" is split between these new players and the original equipment makers. IPR resulting from collaborative R&D projects is managed in line with the "Holst model". This model aims at free usage of the pooled IP as the main remuneration for contribution but has recently come under pressure.

#### **Electricity grid industry (smart grids and smart metering)**

Standards are of key importance to the electricity grid industry and ensure interconnection and interoperability. Standards are developed in CEN, CENELEC, ETSI and IEC with important elements, such as smart utility meters, based on EU mandates. Grid operators as the main implementers pay for embedded patents as part of the equipment procurement process. Separate licensing is rare. Patent application numbers in this area are however rising fast and the spread of communication and information technology will confront the industry with new players following different IPR strategies than the current ones.

### **Barriers to efficient SEP licensing**

The study analyses the principal problem of efficient SEP licensing and the technological trends and changes in the patent landscape that the current rules and institutions which govern this problem face. The focus is on practical aspects and this study should be interpreted as a source of inspiration to improve current rules and institutions.

#### **The principal problem to be solved**

SEP licensing is efficient if licenses are concluded with minimum of search, negotiation and dispute resolution costs to both parties and on terms that guarantee the technology contributor a fair return

on his investment while enabling the implementer to use the standard at reasonable costs and on a level playing field. SEP licensing becomes more difficult with increasing number of SEPs as well as with increasing numbers of patent holders and of patent users. There is a clear and pronounced upward trend in these numbers.

The difficulty exists both for patent holders as well as for implementers: Lack of transparency raises search, negotiation, and dispute resolution costs on both sides. The risk of opportunistic behaviour of the other side exists both for patent holders as well as patent users and harms in each case not only the other side, but via an externality also the entire industry (e.g. an excessive payment to one patent holder will diminish the revenue available to other innovators; non-payment by one implementer will harm other implementers by giving it an unfair competitive advantage). The problem of royalty stacking exemplifies this interdependence: Due to externalities, the individual setting of royalty rates by a large number of SEP owners can result in a combined royalty burden that is equally detrimental to patent holders.

### **Lack of transparency regarding SEPs**

A lack of patent transparency (including asymmetric information) is a key issue inhibiting efficient licensing. Transparency is crucial at two moments in time: Before adoption of the standard it allows standardization participants to make an informed choice. After adoption of the standard it forms the basis of clear licensing agreements. Patent transparency relates to the existence of a patent but also its scope, validity, ownership and enforceability.

To achieve patent transparency SSOs have adopted rules obliging ex ante disclosure of SEPs and they maintain databases on what has been disclosed. The SEP declaration system and the databases used for this purpose are the cornerstone of SSO efforts to increase patent transparency. They currently have however a number of limitations which this study analyses, such as a limited level of detail of patent declarations, a limited accuracy in terms of validity, essentiality and enforceability of the declared patents and no mechanism to ensure the updating of their content.

### **Problems related to specific business behaviour towards SEPs**

Basing standards on patented technologies creates a number of risks of opportunistic behaviour which the system has to safeguard against. These safeguards must prevent specific cases of opportunistic behaviour. The study analyses notably patent ambushes and submarining, hold-up and reverse hold-up, categorical discrimination against new entrants and unsolicited bundling of SEPs with other patents.

The IPR rules must however also cope with a constantly changing technological and patent landscape and changes in business behaviour. The study thus examines the vertical dis-integration of companies giving rise to a divergence of SEP ownership on the one hand and standard implementation on the other, the increased transfers of ownership of SEPs with a higher emphasis on monetizing patents and an increased rate of SEP litigation.

### **Possibilities for improving the system**

The study reviews and analyses a total 15 specific options to improve the current system governing patent-based standardization. These are the following ideas:

### **Improvements to the patent declaration system**

As a set of measures to target the lack of patent transparency by fine-tuning the current patent declaration system, the study has analysed the following options:

- Updating patent declarations at key events, such as the adoption of the standard, the granting of the SEP, the invalidation or expiry of the SEP, the transfer of ownership;
- More precise and thus informative patent declaration, notably as regards information to substantiate essentiality;
- Checking essentiality of declared patents as a matter of routine;
- Entering licensing information in SSO database;
- Limiting the use of blanket disclosures, currently allowed by some SSOs;
- Notification of transfer of SEP ownership by recordation;
- Increased collaboration between SSOs and patent offices by linking the respective databases; to improve the usefulness of SSO databases in a cost efficient manner and also to allow patent examiners better access to prior art material.

### **Promotion of patent pools**

Patent pools provide a one-stop solution for licensing a bundle of standard essential patents owned by different entities, thereby aiming to mitigate transaction costs, avoid royalty stacking and create a level playing field. Given these benefits the study has examined the following aspects:

- Strengthening the relation between SSOs and pools;
- Providing incentives to SEP holders to participate in patent pools;
- Encouraging entities such as universities and SMEs to participate in patent pools.

### **Providing efficient dispute resolution mechanisms**

Efficient SEP licensing also requires efficient mechanisms to resolve disputes where these occur. The study has thus examined the following aspects:

- The benefits and costs of providing such dispute resolution mechanisms and of the different types of dispute resolution mechanisms (arbitration, mediation, "med-arb", mini-trials);
- The integration of dispute resolution mechanisms into the standardization process and the incentive for participants to use them;
- The substantive and procedural aspect of setting up such dispute resolution mechanisms.

### **Clarifying FRAND royalty rate and royalty base**

The commitment to licence SEPs on FRAND terms is widespread. However, the notion of FRAND is in general not defined by the IPR policies of SSOs. The study focuses on achieving a higher degree of clarity on two aspects, for the benefit of negotiating parties as well as adjudicators:

- The royalty rate which could be defined in relation to its economic value, its ex ante value before standard adoption or the incremental value over competing technologies;
- The royalty base which could refer to the final product or to the component implementing the patent and the related question on the step in the value chain where licensing occurs.

### **Transfer of SEP ownership**

Safeguards such as the commitment to licence on FRAND terms oblige directly only the initial patent owner having declared the patent as essential. In case of a subsequent transfer of the ownership of this patent the subsequent owner must be bound as well. This can be done by defining or strengthening SSO rules that bind subsequent owners of SEPs to the initial FRAND commitments or by promoting the use of a License-of-Right system to ensure that commitments to licence SEPs on a reasonable and non-exclusive basis are tied to the patent itself, whoever its owner.

### Improved guidance on inclusion of patented technologies

Finally, the study examines the need for improved guidance to those who adopt standards on the inclusion of patented technologies in the respective standard. The benefit of such guidance would lower the number of SEPs and increase the quality of the remaining SEPs thereby providing incentives for real innovators to engage in R&D and reduce unnecessary costs (both royalties and otherwise) associated with over-inclusion of technologies and complexity of standards. It may also reduce the costs associated with oligopolistic competition in the upstream market for necessary technologies and promote the adoption/uptake of the standard.

### Potential solutions stemming from non-standard dependent industries

The study also examines the patenting and licensing practices in four additional industries: chemicals, diagnostics, mechanical engineering and nano-technologies. These four industries rely less on standardization but are, at least in key parts, characterised by high levels of R&D, significant patenting and a high degree of complementarity between patents.

The study examines how these industries deal with problems of patent transparency and patent thickets and identifies innovative and collaborative solutions that could be instructive for the standardization context, such as:

- Augmented patent databases create added value by the "crawler-based" and thus automatic generation of content and its unified presentation. Additional functionalities include inter alia alerts, links, grouping of patents;
- Technology exchange clearing houses provide standardized services to support bilateral licensing negotiations;
- Publicly funded landscaping provides examples of transparency enhancing interventions into specific areas of public interest;
- Crowd-sourced validity checks reduce the costs of validity checks by organizing, for example via a wiki, and incentivizing the larger expert community to perform these checks;
- Non-profit patent pools can be instructive as experience with public funding of patent pools;
- Managed IP-exchanges break down IP into unit licence rights and offer stock exchange trading of these, thereby avoiding costly design of individual license agreements and providing objective criteria of IP values;
- IP supermarkets aim at facilitating licensing by offering patents to a potential licensor in a standardized manner and allowing them an easy choice of what to licence;
- Open access clearing houses aim at facilitating collaboration on an open and royalty-free basis and target areas where the focus is on accessibility of the patents.

Some of these solutions seem suitable for a wide range of patent-based standards, while others require specific circumstances to succeed. The "clearing house concept" offers a conceptual framework for the move from a database to more advanced forms of collaboration in licensing.





