

SMEs And Standard Essential Patents: Licensing Efficiently In The Internet Of Things

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I. Introduction

Modern knowledge-based economies increasingly rely on standards upon which innovative products are built. Standards allow businesses to benefit from economies of scale, to specialise in what they do best and invest in product differentiation. Standards reduce barriers to trade, create open markets and a level playing field, thus spurring competition and innovation. Consumers also reap substantial benefits from standardisation, in terms of lower prices, wider and interoperable product variety and more innovation. Standards can be arrived at either through unmediated market competition processes as de facto standards, or through industry coordination within standards-development organisations (SDOs.)

In a consensus-driven process SDOs select the best technologies amongst technical contributions resulting from substantial R&D investment, with a view to solving complex technical problems raised in standards development.² Although open and accessible to all interested parties to implement, standards often comprise proprietary technologies contributed by technology sponsors. In particular, innovative ICT standards involve hundreds or even thousands of patents reading on standards specifications, without access to which implementation is technically impossible.

Standard-essential patents (SEPs) enable innovators and contributors to benefit from positive externalities from standardisation and earn a fair return on their investment in R&D. Standardisation has facilitated the emergence and growth of a vibrant and open innovation marketplace, bringing together contributors of cutting-edge technologies and suppliers of innovative consumer products and services.³

This has only been possible thanks to the commitment of contributors to make their technology essential to the standard accessible on Fair, Reasonable and Non-Discriminatory (FRAND) terms and conditions. Its significant benefits notwithstanding, collaborative standardisation is a costly and risky affair. Meaningful involvement in SDOs and their working groups requires substantial investment in R&D and in human capital, including highly specialised and experienced standardisation experts. Such challenges to effective participation are especially pronounced for small and medium-sized enterprises (SMEs).⁴ SMEs form the backbone of European economies. The 23 million European SMEs account for 98 percent of businesses and provide for around 80 percent of private-sector jobs in Europe.⁵ But SMEs' involvement in standardisation fails to reflect their paramount importance for jobs and growth; SMEs lag behind bigger companies in standardisation.⁶ A major reason for SMEs' secondary role in collaborative standardisation is technological complexity and the scale of investment needed to develop a competitive technological platform.

Yet at the same time standardisation offers an open ecosystem within which SMEs can successfully contribute their innovative technologies.⁷ This is largely due to

1. The views expressed herein belong to Dr. Claudia Tapia, LL.M. alone and do not necessarily represent Ericsson's views.

2. Claudia Tapia, "Securing a Competitive Future in Europe, The Patent Lawyer," explaining that in only one Working Group of the several ones established to develop the LTE Standard 23,235 technical contributions were submitted, from which less than 16% were selected to become part of the standard. (January/February 2016).

3. Haris Tsilikas, "Collaborative Standardization and Disruptive Innovation: The Case of Wireless Telecommunication Standards," Max Planck Institute for Innovation and Competition Research Paper No. 16-06 (May 17, 2016). Summary available at http://www.4ipcouncil.com/download_file/view_inline/163

4. The term SMEs refers to businesses employing less than 250 employees. SMEs are further distinguished between micro enterprises, employing fewer than 10 employees, small enterprises employing between 10 and 49 employees and medium-sized enterprises employing between 50 and 250 employees. "Thinking Big for SMEs," European Commission, Luxembourg: Publications Office of the European Union (2011) 1. <http://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=0ahUKEwjDfSxr5LUAhXGEVAKHZKFDNwQFggqMAE&url=http%3A%2F%2Fec.europa.eu%2FDocsRoom%2Fdocuments%2F874%2Fattachments%2F1%2Ftranslations%2Fen%2Frenditions%2Fpdf&usq=AFOjCNGrPSSkUhODkhke4hdLRTIo5pWpFA>.

5. "Thinking Big for SMEs," European Commission. See also Franc Le Gall and Martin Prager, "Participation of SMEs in Standardization," (ETSI White Paper no. 6, (2011) http://www.etsi.org/images/files/ETSIWhitePapers/WP_No_6_SME_FINAL.pdf).

6. Henk de Vries, Knut Blind, Axel Mangelsdorf, Hugo Verheul and Jappe van der Zwan, "SMEs Access to European Standardization: Enabling Small and Medium-Sized Enterprises to Achieve Greater Benefit from Involvement in Standardization," (2009) https://www.eric.europa.eu/eric/content_area/news/2009/smeaccessreport%202009.pdf.

SDOs' high due process standards that many proprietary ecosystems fail to observe. Nonetheless, once their technology is selected to become part of a standard, SMEs depend on effective intellectual property protection in order to earn a return on their R&D investment. SMEs have hitherto enjoyed the potential of the patent system for incentivising innovation and commercialisation of knowledge only to a limited extent.⁸

SMEs can enhance their competitiveness and reputation not only by contributing but also by implementing formal standards in their products. However, SMEs which are purely implementers are said to often lack the skills necessary to identify the key players in the field, and the reasonable compensation for the technology they are using, and do not know how to react to licensors that fail to offer FRAND terms. In the context of the Internet of Things, in particular, where billions of devices are interconnected, it is crucial for SMEs to establish a good IP strategy.

The present article will attempt briefly to outline the challenges SMEs face in licensing within the field of ICT standardisation and provide some practical solutions that might contribute to overcoming them. In part II we discuss the EU policy framework for standardisation and SMEs; in part III the scenario of SMEs as technology contributors and licensors, and our recommendations; in part IV the issues for SMEs as implementers of standards and licensees, and possible solutions; in part V the IoT new licensing model and in part VI the conclusions of the present article.

II. EU Policy for Standardisation and SMEs

Standards and collaborative standardisation are a valuable instrument of international market integration and of lowering non-tariff barriers to international trade.⁹ Hence they are also central to the integration of the internal market of the EU and they have been at the centre of a wide array of EU policies, such as the Europe 2020 Strategy for sustainable and inclus-

ive growth and the Digital Single Market Strategy.¹⁰ EU standardisation policy is closely intertwined with the establishment and operation of the three official European standardisation organisations (ESOs), ETSI, CEN and CENELEC.

The ESOs develop mandated European Standards, but they also engage in cutting-edge market-driven standardisation, in particular in ICT sectors. ESOs are expected to observe strict standards of openness to all interested parties, transparency and consensus in decision-making and voluntary application of standards, in accordance with standardisation best practices elaborated in the WTO Agreement on Technical Barriers to Trade.¹¹ Standardisation is also particularly relevant from an EU competition policy perspective. The EU Commission in its Horizontal Guidelines has set out a comprehensive framework for assessing the impact of standardisation agreements on competition and has provided a safe harbour from liability under Article 101 TFEU for agreements with the object or effect of restricting competition;¹² SDOs that observe the aforementioned principles of transparency, openness, due process and voluntary accessibility, as well as the principle that essential IPRs (Intellectual Property Rights) are to be made accessible on fair, reasonable and non-discriminatory (FRAND) terms, are immune from competition law liability under Article 101 TFEU.¹³

EU policymakers pay close attention to the issue of SME participation in collaborative standardisation.¹⁴ Regulation 1025/2012 “on European standardisation”

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7. Kirti Gupta, “The Role of SMEs and Startups in the Standards Development Process,” showing a probability of approval of 33.37 percent for SMEs/Start-ups contributions versus a 29.06 percent probability if the submission is made by non-SMEs/non-Startups. (forthcoming, 2017).

8. According to an SME scoreboard, 35 percent of SMEs do not take any measures to protect their innovations, citing various reasons, such as the cost and complexity of the patent system. See European Union Intellectual Property Office (EUIPO), *IP SME Scoreboard* (2016). https://euipo.europa.eu/tunnel-web/secure/webdav/guest/document_library/observatory/documents/sme_scoreboard_study_2016/sme_scoreboard_study_2016_en.pdf

9. “Agreement on Technical Barriers to Trade,” Annex 3, World Trade Organization. See also “Regulation of the European Parliament and of the Council,” (October 25, 2012) on European Standardisation OJ L 316/12, recital 6. (2012).

10. Regulation on European Standardisation, recital 5. See also Communication from the European Commission, A Strategic Vision for European Standards: Moving Forward to Enhance and Accelerate the Sustainable Growth of the European Economy by 2020, COM (2011) 311 final: 3. Communication from the European Commission, A Digital Single Market Strategy for Europe, COM (2015) 192 final, 15-16.

11. “WTO Agreement on Technical Barriers to Trade,” Annex 3.

12. Communication from the European Commission, “Guidelines on the Applicability of Article 101 TFEU to Horizontal Cooperation Agreements,” C3/2, 2001, paras 257-335.

13. *Ibid.* para 280.

14. European Parliament Resolution (October 21, 2010) on “The Future of European Standardisation,” [2010/2051(INI)].

calls for ESOs to adopt concrete and specific measures to enhance the accessibility of standards and of the standards development process to SMEs.¹⁵ Moreover, SMEs can benefit from a congenial regulatory framework, such as the Small Business Act,¹⁶ and a variety of public funding, including subsidies by the Horizon 2020 project, the European Structural and Investment Funds¹⁷ and reduced SDO membership fees. SDOs have also undertaken steps to lower participation costs, in particular through the use of online working group meetings and online communication that reduce travelling costs for SME representatives.

SMEs engaged in standardisation also benefit from collective representation by industry bodies and organisations, such as the Small Business Standards, an organisation established in 2013 to represent SMEs in European standardisation bodies.¹⁸ Additionally, the EU, the European Patent Office (EPO) and national patent offices within the EU have taken measures to reduce the cost and enhance the accessibility of the patent system to SMEs. Support to SMEs may include lower patent filing and renewal fees, IP training for SME executives, IP helplines and the creation of the IPR Helpdesk which offers assistance and expertise to SMEs.¹⁹

It is true that such policy measures have had some effect in boosting SME participation in standardisation. In ETSI, for instance, SMEs now account for 28 percent of its membership, and of participating SMEs 65 percent are active—both as contributors and implementers—in standardisation committees. Moreover, SMEs have managed to hold 10 percent of ETSI working group elected positions, such as chair, vice-chair and rapporteur.²⁰ Moreover, SMEs may have strong private incentives to participate in standardisation. Engagement in standardisation and implementation of standards present significant business opportunities for SMEs: they can benefit from access to cutting-edge technologies, from interaction with some of the most important technical experts in their field, from the opening-up of new markets and economies of scale, from increasing visibility and opportunities for beneficial partnerships, and from signalling their innovation capacity.²¹ Standards also lower regulatory compliance

costs for SMEs and they enable interoperability and compatibility between products and components.²²

Yet significant challenges to a meaningful SME participation remain. An important weakness of EU support measures to SMEs in standardisation is their generalist nature: they mostly attend to the collective needs of SMEs, they enhance for instance their collective representation in SDOs, and they are not tailored to individual SME needs. More importantly, a generalist outlook fails to grasp the heterogeneity of incentives and interests of SMEs that wish to engage in standardisation. In particular, collective support measures lose sight of the significant distinction between SMEs that are active in the *development* of standards by contributing their technologies and SMEs that are mainly interested in *implementing* the standards in their products and services.

III. SMEs as Technology Contributors—Licensors

A. Costs

SMEs contributing to standardisation must bear the substantial costs of patent development, licensing and enforcement. Since standardisation involves international or even global markets, patent protection and enforcement must also be on an international scale, further raising costs: a PCT application for instance costs between EUR 10,000 and 40,000.²³ An OECD survey shows that 24 percent of firms in Europe declare having patents that they would be willing to license out but could not. Some factors mentioned were the complexity and cost of drafting and negotiating contracts, the low royalty rates offered and the difficulty of identifying partners.²⁴

Moreover, monitoring infringement, negotiating licensing deals and drafting contracts might require an investment of EUR 2 million to 3 million.²⁵ Added to that, licensing negotiations might break down, bringing

15. Article 6, Regulation on European Standardisation.

16. Communication from the European Commission, “A Small Business Act for Europe,” COM, 394 final (2008).

17. A Digital Single Market, 18.

18. “Small Business Standards, Who are We?,” <http://www.sbs-sme.eu/who-are-we>.

19. Philippe Deléarde and Séverine Ouvry, “Exploitation of IP for Industrial Innovation,” Report to the Commission Ref. Ares 4677128, 13 (2015).

20. Le Gall and Prager, “Participation of SMEs,” 5.

21. “Small Business Standards, Best Practices on Small and Medium-sized Enterprises in Standardisation,” (2015). http://www.sbs-sme.eu/sites/default/files/publications/Best%20practices%20towards%20SMEs_with%20footer.pdf.

22. Ibid.

23. ECORYS and Eindhoven University of Technology, “Patents and Standards: A Modern Framework for IPR-based Standardization,” Study carried out for the European Commission, Ref. Ares 917720 - 25/03/2014, 66, (2014). <http://ec.europa.eu/DocsRoom/documents/4843/attachments/1/translations/en/renditions/native>.

24. Pluvia Zuniga and Dominique Guellec, “Who Licenses out Patents and Why?: Lessons from a Business Survey,” OECD Science, Technology and Industry Working Papers, 2009/05, (2009). <http://dx.doi.org/10.1787/224447241101>.

25. ECORYS and Eindhoven University of Technology, “Patents and Standards,” 112.

high litigation costs, possibly in many jurisdictions, into the picture.²⁶ Despite widespread perceptions that ownership of SEPs automatically confers the opportunity to reap supra-competitive rents by holding up implementers,²⁷ when transaction costs are taken into account it becomes apparent that patent holders with insufficient resources often struggle to license their technologies and earn a return on their investment.²⁸

B. Recommendations

To begin with, it is crucial that SMEs achieve adequate IP protection for their technologies. It is important that promising ideas be protected by well-drafted, strong patents that can provide value in subsequent licensing negotiations. Most SMEs lack dedicated employees that could manage in-house patent development and portfolio building. When contacting external patent lawyers, SMEs should identify those experienced in the technology field they wish to protect. Otherwise the SME may not be able to show infringement of its patent by some products that, if well drafted, its patent could have covered.

Secondly, SMEs could contact SME associations specialised in standardisation and their SDO representatives to inform themselves of the benefits that they can enjoy by participating in a standard development process.

Thirdly, SMEs would also need support in the commercialisation phase of their technologies. They typically lack the experience of larger corporations in complex and resource-draining negotiations, monitoring and enforcement of their IPRs. Since access to private-sector professional services is expensive, it would be advisable to aim for additional financial support. For instance, Fractus, a Spanish company specialised in optimised antennas, raised as a start-up a total of EURO 20 million in venture capital investment, part of which it reinvested in licensing and enforcement, leading to

cumulative payments of well over \$100 million.²⁹

Fourthly, an SME undertaking a FRAND commitment should offer access on FRAND terms. For that it should establish a mechanism to determine FRAND accurately. Otherwise an SME patent holder risks not obtaining an injunction against an infringer from a court. To determine the value that its technology has for the end product, an SME first needs to determine a reasonable cumulative royalty rate. This can be done by looking at former declarations made by main contributors of the standardisation,³⁰ as well as at studies that estimate the cumulative rates by analysing published declared rates, companies' annual reports and other reliable data (such as information disclosed in court cases and rates published by patent pools).³¹ However, SMEs should view with scepticism studies based on purely theoretical models which are often far from marketplace realities.³² As a next step the patent holder needs to determine which is the proportion of that cumulative rate that it is entitled to. Some questions when determining the value of the contribution are the following: Does my contribution belong to the core of the standard, or is it an option that need not be implemented? Who else has contributed to the standard, and how much? How much is their understanding of their proportional share and which is the method applied for such determinations?

26. "Making Intellectual Property Rights Work for Small and Medium-size Enterprises—Preparation and Enforcement," IPR Enforcement Expert Group (2009) 25.

27. Marc Lemley and Carl Shapiro, Patent Holdup and Royalty Stacking, *Texas Law Review* 85, 2006: 1991; Joseph Farrell, John Hayes, Carl Shapiro and Theresa Sullivan, Standard Setting, Patents, and hold-up, *Antitrust Law Journal* 74.3, 2007, 603-670.

28. Thus, it is not surprising that an empirical study on patents declared to some of the world's most significant SDOs found that for a substantial 30 percent of the sample, the patent owners failed to pay the renewal fees and their declared patents were left to lapse. See ECORYS and Eindhoven University of Technology, Patents and Standards, 263.

29. Joff Wild, "Fractus Proves the Power of Patents to Deliver Sustained, Game-changing Success to Tech Start-ups (March 2017). <http://www.iam-media.com/blog/detail.aspx?g=8b79a108-0a83-4610-b906-ac4f89a17811>

30. For instance, major contributors in standardization, Alcatel-Lucent, Ericsson, NEC, NextWave Wireless, Nokia, Nokia Siemens Networks and Sony Ericsson supported publicly in 2008 that a reasonable maximum aggregate royalty level for LTE essential IPR in handsets should be a single-digit percentage of the sales price. See Wireless Industry Leaders commit to framework for LTE technology IPR licensing (April 2008). <https://www.ericsson.com/en/press-releases/2008/4/1209031-wireless-industry-leaders-commit-to-framework-for-lte-technology-ipr-licensing>. See also Ericsson's FRAND licensing terms for 5G/NR in 3GPP Release 15 at <https://www.etsi.org/about/how-we-work/intellectual-property-rights-iprs/ex-ante-disclosures/list-of-ex-ante-disclosures> qualified by deputy chief judge of IP division at Shanghai High People's Court Ding Wenlian as a possible signal of a reform of the mechanism for licensing SEPs. See MLEX, Ericsson's FRAND offer on 5G network welcomed by senior Chinese antitrust judge (May 2017).

31. Alexander Galetovic, Stephen Haber, Lew Zaretski, "A new Dataset on Mobile Phone Patent License Royalties," *IP² Working Paper* No. 16011 (2016).

32. See e.g. Mallinson criticising estimated cumulative rate of 120 USD on a hypothetical 400 USD smartphone. Keith Mallinson, "WiseHarbor, on cumulative mobile-SEP royalties," For IP Finance, (August 2015). <http://www.ip.finance/2015/08/cumulative-mobile-sep-royalty-payments.html> <http://www.wiseharbor.com/pdfs/Mallinson%20on%20cumulative%20mobile%20SEP%20royalties%20for%20IP%20Finance%202015Aug19.pdf>; Ann Armstrong, Joseph J. Mueller, and Timothy D. Syrett, "The Smartphone Royalty Stack: Surveying Royalty Demands for the Components Within Modern Smartphones."

Fifthly, it would be advisable for SMEs to prepare claim charts to demonstrate the essentiality of the patent.

C. Effective patent protection

For SMEs contributing to standards development it is very important to know they can rely on an effective patent system that adequately protects their contributions and allows them to earn a fair return on their investment in R&D.³³ The operation of the patent system in the standards-setting context has been a subject of controversy in the past decade. Several commentators allege that ownership of SEPs and the threat of injunctive relief against implementers of standards results in patent hold-up, raising the cost of commercialisation of technology and increasing prices for consumers.³⁴ It is not the subject of the present article to assess in detail the merits and shortcomings of the patent hold-up theory.³⁵ However, to the extent it influences public policy in the EU and abroad it is useful to stress the value of an effective patent system to contributors to standards and in particular to SMEs.

A weakening of patent protection and in particular a prohibitive rule on injunctions for SEPs does not only diminish the return on investment on R&D for contributors by unfavourably skewing bargaining power,³⁶ it also diminishes incentives to share one's own technologies and contribute to standards in the first place. An effective patent system is all the more important to SMEs contributing to standards. For SMEs and start-ups in particular, strong IPR protection is crucial for attracting funding by venture capitalists and banks.³⁷ Often IPRs are the most valuable business asset SMEs hold.³⁸ Moreover, patent monetisation is a valuable source of income for SMEs, with which they can fund

their R&D and standardisation activities.³⁹

In the EU a strong commitment to patent protection is enshrined in EU law, in Member States' national patent laws and it is also part of the Union's international obligations under the WTO TRIPS Agreement. The Enforcement Directive establishes the framework for IP protection in the EU, and in particular IPR holders' rights to preliminary and injunctive relief.^{40,41} The right to injunctive relief is also established under articles 28 and 44 of the TRIPS Agreement to which the EU and its members are parties. Patent protection in the EU is further streamlined and enhanced by the formation of a single market for IPRs and in particular by the establishment of the unitary patent and the unified patent court system.⁴² The unitary patent may substantially improve the accessibility and affordability of the patent system in the EU to SMEs;⁴³ it is estimated that today the cost of patent protection for the whole duration of the right in all EU Member States is EUR 200,000.⁴⁴ Moreover, the unified patent court has the potential to provide for more legal certainty, in allowing for a more harmonised patent protection throughout the EU.⁴⁵

To the extent injunctive relief for SEPs confers market power to patent holders, enforcement of SEPs is also relevant from an EU competition law perspective and Article 102 TFEU on abuse of a dominant position.⁴⁶ In its recent landmark ruling in *Huawei v ZTE*, the Court of Justice of the EU (CJEU) provided a balanced, market-oriented framework for licensing negotiations for SEPs.⁴⁷ Specifically, the CJEU set out

33. "Making enforcement rules fit for innovative SMEs." IP Europe, <http://www.iptalks.eu>.

34. Le Gall and Prager, "Participation of SMEs," 8.

35. For a critical view on the patent hold-up theory see among many: Gregory Sidak, "Holdup, Royalty Stacking, and the Presumption of Injunctive Relief for Patent Infringement: A Reply to Lemley and Shapiro," *Minn. L. Rev.* 92 (2007): 714. See also Damien Geradin, and Miguel Rato, "Can Standard-setting Lead to Exploitative Abuse? A Dissonant View on Patent Hold-up, Royalty Stacking and the Meaning of FRAND," *European Competition Journal* 3.1 (2007): 101-161; Einer Elhauge, "Do Patent Holdup and Royalty Stacking Lead to Systematically Excessive Royalties?," *Journal of Competition Law and Economics* 4.3, 2008, 535-570.

36. Zuniga and Guellec, "Who Licenses Out," 8.

37. Sabattini and Mosca, "Standard Development," 50. Zuniga and Guellec, "Who Licenses Out," 22. ECORYS and Eindhoven University of Technology, "Patents and Standards," 65.

38. European Commission, "Thinking Big for SMEs," 16.

39. Small Business Standards, "SBS Answers to Public Consultation on Patents and Standards," (2015). <http://www.sbs-sme.eu/publication/sbs-answers-public-consultation-patents-and-standards>

40. *Ibid.*

41. Directive 2004/48/EC of the European Parliament and of the Council of 29 April 2004 on the enforcement of intellectual property rights [2004] OJ L 157/45, Article 11.

42. See all relevant documents of the Unified Patent Court and the Unitary Patent at About the Unified Patent Court, <https://www.unified-patent-court.org/about>. See also Communication from the European Commission, "A Single Market for Intellectual Property Rights Boosting Creativity and Innovation to Provide Economic Growth, High Quality Jobs and First Class Products and Services in Europe," COM (2011) 287 final (2011): 7.

43. Small Business Standards, "SBS Answers."

44. See also Communication from the European Commission, "A Single Market for IPRs."

45. *Ibid.*, 8.

46. It should be noted that ownership of SEPs does not automatically infer a dominant position. See Case C170/13, *Huawei v. ZTE* [2014], Opinion of the AG Wathelet, paras 57-58; for a detailed discussion of the issue of dominance and SEPs ownership see *Unwired Planet Ltd v. Huawei Technologies* [2017] EWHC 711 (Pat), paras 630-670.

47. Case C-170/13 *Huawei v. ZTE* [2015]. For a summary of the court cases post Huawei interpreting the CJEU ruling see <http://www.4ipcouncil.com/search/case-law>.

the conditions under which pursuit of injunctive relief from an SEP holder against a potential licensee willing to conclude a licence on FRAND terms might amount to an abuse of dominant position. Under exceptional circumstances, the exercise of an SEP holder's otherwise legitimate rights to injunctive relief might breach Article 102 TFEU if the patent holder has failed to alert the alleged infringer of his infringement of specific SEPs and to submit a detailed, written licence offer on FRAND terms.⁴⁸

On the other side, the prospective licensee must establish his willingness by replying to the offer in due time, without delaying tactics, and if the initial offer is considered non-FRAND to submit a FRAND counteroffer, whilst providing appropriate security.⁴⁹ The CJEU *Huawei* ruling provides clarity to parties to SEP licensing negotiations, and establishes a fair and predictable framework within which the patent holder is immune from competition law liability and the implementer is safe from injunctions. The *Huawei* ruling also provides strong incentives for both parties to engage in good-faith licensing negotiations.⁵⁰

IV. SMEs as implementers of standards

A. Costs

The majority of SMEs with an active interest in standardisation are users of standards: small firms that build innovative products on top of standards. However, they too face significant constraints in the effective implementation of standards. A first hurdle is substantial information costs to trace and implement a relevant standard.⁵¹ Many SMEs find it particularly challenging to navigate through the abundance of standards produced by SDOs.

To the extent standards cover complex technological platforms including a multitude of essential IPRs, the transaction costs of licensing might be substantial. Moreover, SMEs might find it difficult to assess whether a licensing offer presented to them by an SEP holder is compliant with FRAND. SEP licensing negotiations are typically confidential and third parties have no access to agreed terms by competitors in similar situations.⁵² An SME with no experience in licensing negotiations might have a hard time in evaluating an offer and coming back with a FRAND counteroffer.

It should be noted that the issue of IPR licensing might not be as troubling as it appears at first sight.⁵³ IPRs enforcement entails substantial transaction costs. Monitoring costs for infringement by SMEs are particularly high. Moreover, even large firms' licensing department capacities are constrained and they typically target large competitors first.⁵⁴ Many SMEs stay below the SEP holders' radar and make unlicensed use of essential IPRs.⁵⁵ For many SEP holders it might also make more business sense to allow SMEs and start-ups some breathing space in the early stages of their development and allow them first to succeed and establish a more durable market presence and later reap licensing rewards. In the end these high investments in standardisation belong to a long-term project where SEP holders benefit from their future licensees' success in implementing the standardised technology.

B. Recommendations

Firstly, SMEs could benefit from the expert advice provided for by their industry associations, but they would benefit even more from access to a pool of experts. Professionals with experience in SEP licensing agreements might prove particularly helpful for both determining essentiality in an SEP portfolio and for assessing a technology's actual merit and contribution to a standard, and hence the compliance of a licensing offer with FRAND.

Secondly, SMEs should reject any FRAND determination based exclusively on SDO databases of patents declared as potentially essential. Since SDOs publish voluntary declarations of essential IPRs (without any assessment of the actual essentiality of declared IPRs)⁵⁶ this may create confusion to SMEs. SMEs need to be aware that a database is not a list of all essential patents for a standard but rather a commitment that any of those patents, if they become essential, will be accessible on FRAND terms.⁵⁷

Thirdly, SME implementers should also have an understanding of what is an appropriate reasonable rate to which an SEP holder is entitled. For this purpose, the same recommendations as mentioned above for the SME contributors apply.

Fourthly, SME implementers should identify the most important patent holders in the relevant standardisation field and, in parallel, negotiate a FRAND li-

48. Case C-170/13 *Huawei v. ZTE* [2015], paras 61 and 63.

49. For example by providing bank guarantee or depositing an appropriate amount in escrow. *Ibid.*, paras 65-66.

50. Haris Tsilikas, "*Huawei v. ZTE* in Context - EU Competition Policy and Collaborative Standardisation in Wireless Telecommunications," IIC 48(2): 151-178 (2017).

51. De Vries et al, SMEs Access, 12.

52. AVANCI, "Accelerating IoT Connectivity," White Paper (2017) 5, <http://avanci.com/wp-content/uploads/2017/01/2016-Avanci-WP-Final-Jan-24.pdf>

53. An empirical survey of SME users of standards reports that the costs of IPRs licensing is a deterring factor for only the 25 percent of correspondents. See Le Gall and Prager, "Participation of SMEs," 9.

54. ECORYS and Eindhoven University of Technology, "Patents and Standards," 66-67.

55. *Ibid.*

56. *Ibid.*, 114.

57. Usually FRAND commitments are made provided there is reciprocity from the side of the licensee.

cense. This would allow them to recognise reasonable negotiation practices and FRAND terms. To identify the key players in a standard, SMEs can consult reports from agencies such as Signals Research Group or ABI Research, or alternatively extract the information from the 3GPP website, showing which companies have made the most approved contributions to a standard. Although not offering one-to-one accuracy in identification of SEPs, approved contributions provide an informative picture of the most important contributors and thus the strongest patent portfolios.

Fifthly, SMEs should request claim charts to have a better understanding of the essentiality of the technology which is to be negotiated.

Sixthly, the SME implementer should understand its rights and obligations established in the CJEU ruling *Huawei v ZTE* mentioned above.

V. SMEs in the Internet of Things

Although a Digital Single Market consolidating almost 30 national markets into one is expected to contribute EURO 415 billion per year to our economy and create hundreds of thousands of new jobs in Europe, concerns have been raised on whether existing licensing models in standardisation are still efficient or even relevant in the Internet of Things (IoT).⁵⁸ Wireless connectivity will enable billions of products, smart meters, connected cars, remote surgery equipment, etc. to build the IoT. These products incorporating ICT standards will have one thing in common: their primary function will not be connectivity. Nevertheless, they will all benefit from wireless connectivity developed in standards.

As mentioned above, in determining FRAND the SEP holder must ensure that FRAND terms reflect the value of its standardised technology to the end product. However, this could be highly challenging when product use and capability differ. For instance, fully autonomous vehicles require consistent and high-bandwidth coverage, where data transfers occur in milliseconds (i.e. low latency). The quality of service in terms of speed and volume needs to be very high. However, other vertical uses and devices like smart meters are far less demanding.

Taking into account the different uses of connectivity in IoT there was a need to initiate a new licensing platform as the first marketplace for licensing patented cellular technology to the Internet of Things. An independent platform, AVANCI, provides a forum for SEP holders to share their innovations, and for IoT companies one-stop-shop access to those connectivity-enabling technologies for a flat per-unit rate consistent with FRAND.⁵⁹

58. On the role of standardisation for the success of the Digital Single Market, see Claudia Tapia, "Securing a Competitive Future in Europe," *The Patent Lawyer*, (January/February 2016).

59. See more about AVANCI at <http://avanci.com>.

The goal is to provide access to the vast majority of the standard-essential cellular patents and to enable companies to innovate faster. Licensors and licensees benefit from reduced licensing costs allowing discounts on royalty fees. Some of the considerations in determining the value of a licence for a particular application include the need for wide-area connectivity and mobility, the frequency of use, and the required bandwidth.

Since the platform has attracted strong portfolios⁶⁰ SME implementers could also use the AVANCI rate as a benchmark in their FRAND determination when approached by unreasonable licensors.⁶¹ Moreover, making a counteroffer using as AVANCI rates as a benchmark would protect SMEs from the threat of an injunction. For SME licensors using AVANCI could also be a great alternative to bilateral and costly licensing negotiations.

VI. Conclusion

Standardisation would benefit greatly from increased and more meaningful SME participation and contribution. SMEs can offer disruptive and targeted innovations that bring substantial value to consumers. SMEs on their behalf would also benefit from increased involvement in standards development. Standards provide the opportunity to SMEs to compete with larger firms in an open innovation market emphasising the merits and qualities of proposed technologies. SMEs also internalise significant benefits from implementing standards in their products, including economies of scale, better access to large international markets, reduction in compliance costs and increased consumer demand for standard compliant products.

In order to obtain the fruits of its participation in standardisation (as contributors and/or as implementers), SMEs need to develop an efficient IP strategy. Recognising the multiple challenges that SMEs face on both sides of the negotiating table, in the present article we have provided some guidance for SMEs to engage in licensing negotiation of standard essential patents (as licensor and/or licensees) in an efficient manner.

For the Internet of Things where billions of devices will be interconnected, new licensing models, such as AVANCI, will be critical. Only then will we achieve a successful networked society, where everyone, everything and everywhere will be connected in real time. ■

Available at Social Science Research Network (SSRN): <https://ssrn.com/abstract=3009039>

60. Currently the companies in the AVANCI marketplace are Sharp, Qualcomm, Ericsson, InterDigital, Panoptis, KPN, Sony, Unwired Planet, and ZTE.

61. The cumulative rate can only be used as a benchmark since royalty rates resulting from bilateral negotiations of AVANCI patents will likely be higher. The benchmark applies then to products where the value of the standardised technology is similar.