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ANNEX TO THE SUMMARY RECORD OF THE 122nd MEETING OF THE COMPETITION COMMITTEE HELD ON 17-18 DECEMBER 2014

-- Draft Summary Record of the Hearing on Intellectual Property and Standard Setting --

The attached document is an annex to the Summary Record of the meeting held on 17-18 December 2014. It is circulated to Delegates FOR APPROVAL UNDER WRITTEN PROCEDURE. Delegates are requested to respond with any written corrections by 27 February 2015 to Mr Matthew Chiasson [matthew.chiasson@oecd.org] and Mrs Rebecca Lambert [rebecca.lambert@oecd.org].

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SUMMARY OF THE DISCUSSION

by the Secretariat

1. Introduction by the Chairman

1. **The Chairman, Mr Jenny**, began the meeting by recalling that this was not the first time that the Committee had looked at the issue of intellectual property and standard setting: in 2010, there had been a roundtable discussion of standard setting in various areas.[1] It was acknowledged then that there were several pro-competition benefits from standard setting, but also possible risks from collusion between the standard setters, exclusion, deception and patent ambush. The Chair explained that the current session differs in two ways from that in 2010. It will be more of a hearing than a roundtable, and the focus will be on the information and communication technology sector, where new competition policy issues related to standard setting have arisen in recent years. Standards are important in the ICT sector because of interoperability and networking requirements, and there can be a tension between the intellectual property rights of holders of patents essential to the standards, and the necessity for the standards to be open and accessible to many firms. This tension has led international standards setting bodies to require participants to disclose patents essential to the standard at an early stage, and to voluntarily commit themselves to licensing them on terms that are "fair, reasonable and non-discriminatory" (FRAND). This raises the question of how to define FRAND terms, and to ensure that participants act in good faith. For example should patent holders be able use injunctions to prevent recalcitrant firms from implementing the patents, and who should deal with those issues: should it be the courts or the competition policy authorities?

2. To help address those issues, the Chairman introduced five panel experts: Giovanni Napolitano of the World Intellectual Property Organisation; Antoine Dore from the International Telecommunications Union; Dr Anne Layne-Farrar from Charles River Associates; Maurits Dolmans, Partner in the law firm Cleary Gottlieb Steen and Hamilton, and Theon van Dijk of the European Patent Office.

3. The Chairman said that the hearing would be in four parts, first standard essential patents (SEPs), how they are set in practice, how they can lead to hold-up etc; second, what is meant by the terms in FRAND commitments, and how can the competition agencies or the courts deal with this; third, can SEP holders that are committed to FRAND terms legitimately threaten potential licensees with injunctions during negotiations: different countries have different views; fourth, can competition agencies, patent offices and standard setting institutions work together on these issues, and if so in which areas.

4. The Chairman then invited the authors of the Secretariat background paper to present their paper.

1.1 Presentation of the Secretariat background paper

5. The **Secretariat** explained that the purpose of the background paper was to provide an overview of the issues to facilitate the discussion, as a complement to the more advanced papers presented by some

[1] OECD (2010), Policy roundtable on Standard Setting, DAF/COMP(2010)33. See: http://www.oecd.org/daf/competition/47381304.pdf

of the participants. The Secretariat paper describes the process of innovation and standard setting in the ICT sector, specifically its cumulative and complementary nature and the importance of interoperability. There is thus a need for collaboration between patent holders, who might also compete at other levels in the supply chain. Complementary innovation reflects the fact that there are frequently many patents involved in an ICT product, resulting in cross-licensing and co-operation between patent holders and licensees. But this raises the possibility of royalty stacking. Innovations may also build on previous ones in a cumulative process, thus creating externalities, but also making it difficult to allocate appropriate rewards to the different innovators.

6. The challenge for innovators is whether they will join forces to set standards, for example within a standard-setting organisation (SSO). This entails engineers investing many hours of their time in technical meetings to define standards. In practice relatively few of the potentially affected firms actively participate, raising the possibility that they do so for strategic reasons, to ensure that "their" patents are defined to be standard-essential. Intellectual property rights (IPR) policy issues related to SEP patents are the risks of hold-up and/or patent ambush, and these are addressed by SSOs through the declaration of essentiality and FRAND licensing commitments.

2. Standard-essential patents and intellectual property rights: presentations by the panel speakers

7. The Chairman asked Mr Giovanni Napolitano of the Intellectual Property and Competition Policy Division of the World Intellectual Policy Organisation (WIPO) to talk about the tensions between intellectual property rights and standards in general.

2.1 The view from the World Intellectual Property Organisation (WIPO)

8. **Mr Napolitano** said that the first issue is the relationship between intellectual property and standards, and its implications for competition policy and enforcement. The WIPO promotes creativity and innovation by managing international legal instruments that protect intellectual property. It regards IPRs as one of the main tools to encourage and preserve product and service differentiation, as do the competitive markets that competition policy authorities strive to protect. But the choosing of standards limits some intellectual property, and as the Secretariat's background paper noted, the process is sometimes run by a limited number of firms that are not necessarily selected via a competitive mechanism. The WIPO nevertheless believes that standard setting is crucial to promoting further innovation and downstream competition. There has to be a three-pronged balance between: encouraging creativity and therefore IP protection; setting standards that benefit consumers and business; and preserving competitive markets at all levels of the supply chain. Indeed, for several years the WIPO has been running activities and programmes that bring together the IP and competition communities to discuss issues and look for common solutions.

9. The second issue concerns mandatory versus voluntary standards and the related IP and competition law enforcement concerns. Standard-essential patents related to mandatory standards have to be licensed on reasonable terms, but with voluntary standards, it is always possible in theory to invent around them and come up with an alternative voluntary standard. Does that imply that there can therefore be no abuse of market power or dominant position, and thus no room for intervention by the competition policy authorities in relation to alleged infringements concerning SEPs in voluntary standards?

10. The third issue concerns what is meant by FRAND terms. The Secretariat's background paper notes some ambiguity here, and although the courts and academics have addressed the issue, there remains a significant level of ambiguity. Might it be possible for the multilateral organisations around the table and elsewhere to discuss it and possibly achieve a result that goes beyond what national courts and governments may have already determined?

11. The Chairman then invited Mr Antoine Dore, Senior Legal Officer of the International Telecommunication Union (ITU) to explain how the standard setting process works in practice in the ICT sector, if it needs to be fixed, or if it works well, and even if so are there issues that deserve attention?

2.2 The view from the International Telecommunication Union (ITU)

12. **Mr Dore** explained that the ITU is an intergovernmental organisation with 193 member states and 700 industry sector members that work with governments, and it has been producing standards for 150 years. He would structure his discussion around four pillars. The first pillar: why are policy makers interested in ICT standardisation, and does it need fixing? The second is the standard setting process itself and are there rules governing it, the third is the ITU's patent policy and the fourth is the issues that arise when the patent system collides with the standard system.

13. As regards the first pillar, policy makers are interested in ICT standardisation because it plays a crucial role in connecting businesses and people. Without it there is no interoperability, no internet, and neither mobile phones nor fixed telephone lines. Hence standards contribute to economic growth and that of the ICT sector. Telecommunications alone is a 1.8 trillion dollar industry. Referring to his slide presentation[2] Mr Dore noted that there are now 7.1 billion mobile phone subscribers, and about half the world's population has a mobile phone. It is a competitive and dynamic market: India records 6 million new subscribers every month. Devices are more powerful and attractive, there are standards that facilitate the transmission of data and videos, and there is a lot of content. By contrast, fixed telephony is declining, especially in developing countries, because of the huge costs of installing the infrastructure. Mr Dore added that in future it is not 4 billion people that will be connected, but 28 billion things: the internet of things, which will require strong standards to support the technology that will allow ICT devices in cars, in homes, to communicate with each other.

14. Mr Dore emphasised that the fact that the mobile telephony system works well and has expanded, one can call people all over the world, implies that the standardisation system is not completely broken. Nevertheless, there are ongoing IPR wars, and it is not sufficient to say that the system has worked well so far and therefore there is no need to do anything. Standardisation is complex: it has been estimated that an implementer would need to incorporate 250 standards into a portable computer, for example, and probably just as many for a mobile phone. These mobile phone standards are produced by many standards bodies: ITU for voice and video; IEEE for Wi-Fi; 3GPP for communication between the mobile phone and the network; and IETF for internet protocols such as TCP/IP and HTTP are just some examples.

15. There are three kinds of standard-setting bodies: first, those companies producing proprietary specifications, such as VHF, and Adobe's PDF, initially. Second, there are formal standards-developing organisations, or SDOs, which are recognised by governments. The ITU is one such, and with two others, the ISO and IEC, are the only international organisations working in the ICT standards field, and form the World Standards Collaboration, or WSC. There are other bodies such as the ETSI, which is an EU standards body. The third category is more than 800 fora that are generally smaller and have a narrower focus. Apart from the first category, most organisations try to produce open standards that are meant to be implemented by everyone. Some, but not all, accept that patents may be incorporated into these standards in exchange for a FRAND commitment, but all major standard bodies try to promote openness in terms of participation, transparency and access to documents. In the ITU, each member government has one vote as does each company.

16. The great advantages of standardisation are that it promotes innovation and permits interoperability. But there are disadvantages. Standardisation can be biased towards large companies, both

[2] Available at: DAF/COMP/WD(2014)82

sellers and purchasers, because they are better placed to cover the costs of participating in the process. There is also a risk to competition in that while companies participating in the process compete with each other, once a standard is adopted, the competition goes away and implementers have no choice but to adapt to the new standard.

17. Finally, Mr Dore noted that not all ICT standards include patents, and most standards do not include SEPs. But those that do include SEPs are extremely important, for example the 2G, 3G and 4G standards, and also the ITU H.264 standard which is used by 80% of all video transmitted on the web.

18. The Chairman responded that it is very important to find solutions to whatever problems there are, but also to discuss whether those problems are significant enough to justify the Committee's spending all afternoon discussing them. He called on Dr Anne Layne-Farrar of Charles River Associates to comment.

2.3 The view from an economic expert[3]

19. **Dr Layne-Farrar** explained that she intended to cover the holdup and royalty stacking issues, and give some background on the assumptions underlying the relevant theories. Holdup requires lock-in: standard-implementing companies with asset-specific investments can be locked in to the technologies defining the standard. Alternatively, innovators that are contributing to the standard-setting body can be locked in if their technologies have a market only within that standard. For holdup actually to arise there must be an action by the relevant party once lock-in has occurred. So lock-in may occur without necessarily resulting in holdup.

20. Royalty stacking is akin to holdup on a large scale. Implementers may need to use multiple patented inputs held by different parties, each of which charges its own price. The theory of royalty stacking assumes that the implementers need each input in fixed proportions so they cannot play off one supplier against another, and also that the inputs have other uses in other products, so that the suppliers are not locked in to the implementers. The theory arose in Cournot's original problem of brass manufacturers that need both copper and zinc in fixed proportions, but there are other uses for each metal. The application of Cournot theory to patenting first arose in the 1990s in the biotech field, the so-called "patent thicket" problem, and it has spread to other areas since.

21. Courts and agencies have been debating both issues for some time, and they have been incorporated into court decisions. Since holdup can occur only once the standard is set, a benchmark price would be that which the parties would have agreed to during the development of the standard. This is often only a thought experiment because in practice licence terms are mostly negotiated after the fact, but it has provided a guide in both agency and private litigation cases. In addition, the possibility of holdup has guided policies. For example in the European Commission cases against Motorola and Google last year, injunctive relief was prohibited because it was felt that this would provide the SEP holder with the leverage to extract holdup, resulting in an imbalance between parties.

22. Similarly, theoretical royalty stacking potential has been adopted by US courts and in agency decisions in FRAND determination cases. In both the Microsoft versus Motorola case, and in the Re Innovatio case, the judges ruled that royalty stacking potential had to be incorporated into how FRAND was set. If everybody charged what the SEP holder charged, the aggregate burden would be too high, potentially a holdup or royalty stacking rate. Other courts have since ruled that such behaviour has to be proved, the potential for it is insufficient. Indeed, a simple exercise to calculate what the appropriate FRAND rate should be demonstrates the room for error. Suppose a standard requires 5 SEPs, together

[3] See also: DAF/COMP/WD(2014)84 and DAF/COMP/WD(2014)132

contributing 10 units of value to a product. One contributes 5 units, another 2 units and the others one unit each. A potential licensee challenges the FRAND rate of 5 on the most important SEP. The judge knows that the total contribution is 10, and decides, in the absence of detailed information, that each contributes 2 units equally, hence the 5 units demanded is incorrectly identified as a holdup or royalty stacking rate. Or the holder of a one-unit patent argues that the FRAND rate is 2, and using the same methodology, that rate would incorrectly be found to be FRAND. So this approach, which courts have indeed used, risks both false positive and false negative outcomes. Judge Davis's ruling (in the Ericsson D-Link case) barred this approach, and was endorsed by the Federal circuit.

23. These considerations raise the question of what evidence do we have that holdup or royalty stacking are commonplace in the industry. It is hard to research because most licence agreements are confidential and the empirical evidence is slim. Therefore one should look at the indirect evidence. If indeed holdup and royalty stacking are systemic problems in the ICT sector, then one would expect to see stagnant or rising product prices, sluggish innovation and limited entry into those markets. But in practice innovation is dynamic, prices fall in real terms, and both Apple and Samsung, neither of whom partook in the standard setting process in mobile telephony, have taken the market by storm. Hence there is a disconnect between the theory and the facts, because the assumptions behind the theories do not usually hold.

24. According to Dr Layne-Farrar, the reasons for the disconnect lie in the standard-setting process itself. The firms themselves are participating in the relevant organisations, they are co-ordinating with each other and often they do not have alternative market options for licensing their technology. They have an interest in ensuring the commercial success of the standard, and no interest in killing it off with a royalty stack. In addition, cross-licensing and patent pools discourage holdup and royalty stacking, while enforcing a patent is expensive and resorted to only when there is a lot of money at stake. Of course, cross-licensing only works via trade-offs between vertically integrated firms with upstream and downstream operations, while patent pools entail a great deal of co-operation between different firms with different incentives. But by and large, self-interest has limited the emergence of holdup and royalty stacking problems in the markets. Dr Layne-Farrar concluded by saying that more emphasis should be placed on better valuation of patents in disputes.

25. The Chairman concluded that there are therefore issues that merit discussion, and called on a representative from the US Federal Trade Commission to make some comments.

26. The **US** FTC delegate emphasised the importance of the integrity of the standard-setting process for investment and innovation over the long term, and the risks to this from the potential for holdup. Standard-setting organisations seek to mitigate this by encouraging or even mandating disclosure of SEPs and by making FRAND commitments. It is the FTC view that during the period when there is competition over which technology will be embodied in the standard, there should be understanding of the price implications and the importance of FRAND commitments. The competition agencies should focus on these issues. As regards the issue of theory versus practice, most economists agree that in the absence of disclosure of SEPs and of FRAND commitments, there is a significant risk that a patent holder can extract a royalty in excess of the value of its technological contribution. Competition agencies should therefore be concerned about the credibility of FRAND commitments and focus on ensuring that companies abide by them.

27. The Chairman invited Dr Layne-Farrar to respond to the FTC view.

28. **Dr Layne-Farrar** explained that standard-developing organisations recognised very early on the potential for lock-in and so the need for FRAND commitments and oversight by competition agencies. These are important tools for firms for competition in developing patents whether or not compliant with

the standard. But there needs to be real evidence of a failure, given that most standard-setting bodies do have FRAND commitments and other IPR policies in place, before intervening or developing new policies or legislation. Yes, the potential is there but there are mitigating factors and parties work around issues on their own, the SSO's IPR policies are updated regularly, with a delay, when a new antitrust issue surfaces. For example some have implemented rules such that a FRAND commitment travels with a patent, and is not specific to the party that makes it, thus making it impossible to revoke FRAND by selling the patent to another party.

29. An **EU** delegate noted that in the Motorola decision the Commission did have direct evidence of holdup because Apple was prohibited from selling in Germany. In addition, there have been injunctions on the basis of SEPs in Germany and also Korea.

30. Speaking from an SSO perspective, **Mr Dore** said that the ITU had discussed the need for additional empirical evidence before reviewing ITU policy. Their conclusion was that a consensus was impossible to reach, and that it was better to move on and avoid discussing extreme positions, move towards a centre and find ways of further defining what FRAND means. Indeed, it is clear that there is no longer a common understanding of what FRAND means in the ITU. So the nature of the commitment needs to be clarified to maintain the integrity of the system. He would return to this theme in the next part of the meeting.

31. From the floor, a delegate from **Norway** asked whether patent valuation is difficult because the value of a patent might change over time and this may not be clear at the outset. The delegate asked how could patents be valued in light of these challenges, and who should do so. In response, Dr Layne-Farrar said that although it is extremely difficult to do, jurisdictions around the world have been doing it for many years. SEPs are no different in principle but of course they have different constraints, so one would not use exactly the same processes, but the existence of broad arms' length agreements across an industry showing that the market has accepted those rates as FRAND, patent pool rates within the same standard and so on are the same kind of valuation techniques that are applied in traditional infringement cases.

3. FRAND commitments: how they work and what do they mean

32. At this juncture, the Chairman noted that there was a slight non sequitur in the previous discussion: it is very hard to value SEP patents, but it is done all the time, therefore it is doable. This does not mean that the courts always get it right, perhaps they frequently get it wrong. It was thus now time to turn to the discussion of FRAND commitments, their fairness and hence the implicit value of the patents. He called on Mr Dore to discuss how FRAND commitments are used by standard-setting organisations to mitigate holdup and describe the various perspectives on what FRAND means.

33. **Mr Dore** said that FRAND is the vehicle used by the ITU to mitigate abuse of the standards system and strike a balance between the rights of patent holders and implementers. The ITU, ISO and IEC say that patents can be incorporated in standards provided that the holders agree to license their technology under reasonable and non-discriminatory conditions. There are two building blocks: disclosure and licensing commitment. Participants have to disclose their SEPs when they participate in the process, although they have no obligation to do patent searches, and they must file a licensing commitment declaring their willingness to grant licences under FRAND. There are no comparable disclosure requirements or FRAND commitments for non-participants.

34. Mr Dore added that there is a question of when the disclosure should be made. Ideally, it should be as early as possible so that the technical bodies have a good view of the patent landscape. In practice, disclosure might come late, even after adoption of the standard, if for example a company belatedly finds out that it has a SEP. Even so, there is an obligation to disclose. The mechanism of disclosure is a form, a

template that is filled in by the company, which is signed and filed and put into a database accessible by all implementers.

35. Mr Dore added that this standard system has worked well for many years, but the ITU has seen in the past couple of years that tensions have emerged between patent holders and implementers. A high-level patent roundtable was therefore convened in 2012, involving SSOs, regulators, industrialists, government and academia. The outcome was that there was no longer a common understanding on the meaning of FRAND, as previously mentioned. The ITU therefore asked their IPR group to start a series of meetings to clarify the meaning of FRAND. They looked at two issues: injunctive relief and the meaning of "reasonable". Twelve meetings have been held so far, the most recent in late November 2014, more than 130 contributions have been received, but so far there has been no consensus. What emerged was that there are not two issues but three, the additional one being what is meant by non-discrimination.

36. The Chairman said that he would ask the US delegate to respond, as there have been cases and jurisprudence in that country. The questions are: is there any way to define a FRAND commitment; how does one assess the value of a patent in a standard; and what is the role of the competition authorities in the court processes. In the US, were the competition authorities able to advocate or participate in proceedings, and do those authorities have something to say that could be complementary to what the courts could find by themselves?

37. A delegate from the **US** DOJ said that the US antitrust authorities have been cautious and prudent in deciding if there has been a competition law violation involving SEPs and potential for holdup. There is a role for articulating what the concerns are regarding anticipated after-the-fact litigation and its costs, which can be realised through advisory opinions that help the SSOs know when they can get together, and what they can agree on, without running into a competition problem. The US authorities have intervened in court proceedings to help the courts work out a methodology for defining FRAND rates. They also have a role in assessing whether the availability of injunctive relief tilts the playing field, and should be prohibited so that firms concentrate instead on what the FRAND rates should be and deciding monetary payments accordingly.

38. A delegate from the **US** FTC added that it is not the business of the US competition agencies to set FRAND rates, but because of their competition policy grounding they can add important perspectives to the debates. The vast majority are resolved privately, and there is no excessive price provision in the US, so the FTC does not get involved directly, but the FTC does have an important advocacy role to play. They issued a report in 2011, and one of the areas was the issue of remedies. There has been a tendency towards outsized damage awards in patent disputes, and the FTC view is that any damage award or royalty rate should reflect the contribution made by the technology and not any holdup value.

39. A relevant district court decision was the Ericsson D-Link case that was decided in December 2014. It did not decide what the royalty rate should be, but reversed the original damages award, on the grounds that the jury instructions were inadequate. The court emphasised that the aim should be to focus on the value that the patented technology was bringing to the standard-compliant product, independently of the value associated with standardisation itself. The court did not go into how one does that at any great length, but it did cite some other court decisions that involved the construction of hypothetical negotiation frameworks. The FTC view is that a key factor is to look at competitive alternatives, close substitutes that were available before the standard was adopted, to determine the value of the contribution made by the patent.

40. In response to a question by the Chairman that good guidance can be given about bad rates, but whether the methodology to determine appropriate rates is still complicated and tentative, the FTC delegate agreed that the methodology is complex, but that the courts are heading in the right direction.

41. The Chairman said that the EU should intervene in the debate at this stage because there is the concept of excessive or unfair pricing under EU competition law, and that the EU attempts to give guidance on horizontal co-operation agreements. The EU says that a fee should bear a reasonable relationship to the economic value of the IPR. Is this useful?

42. An **EU** delegate said that there has not yet been any national court decision on the issue. A German court was for the first time supposed to set FRAND royalties, in the Motorola and Apple case, but the parties settled out of court. Within EU courts there are disagreements on how to characterise FRAND rights *per se*. Whereas the US says that FRAND creates contractual rights for third parties, the Germans say no, the Dutch say that there is a pre-contractual obligation, but not more, and it is not clear which law should apply. For instance, should standards developed within ETSI fall under French law because ETSI is based in France? The Germans say it should be German law that applies.

43. The EU delegate went on to say that FRAND disputes are not always about royalty rates, they are often about the injunction issue, to be discussed later. There should be a reasonable relationship between the FRAND rate and the value of the IPR but how to define it? The US courts have used a couple of methods but they are very detailed, and cost based methods are not often helpful because of the difficulty of allocating overall costs down to one patent or a part of one's patent portfolio. Theoretical ex ante royalties would be a good guide, but as Mr Dore had said, a lot of patents are declared very late in the process, so there is no comparative to go on. Another option is to use an independent expert assessment of how central is the portfolio for the standard, and look at royalties charged for the same IPR in other standards. But that assumes there is competition between the standards, which often is not the case.

44. In the Microsoft case, the company was obliged to license on FRAND terms, so that was not a genuine voluntary FRAND commitment. The court said that it was not for the Commission to set a specific rate, and the Commission agreed that it should not become a FRAND regulator. The excessive pricing tool exists, of course, but it is limited to saying that a rate is clearly too high, not what it should be. The guidelines evidently say that the parties should be free to solve their problems before the court, or even better in private negotiation.

45. The chairman turned to India, where the competition authority had become involved in FRAND disputes.

46. The competition authority delegate from **India** said that they had existed for only 5 years. Competition law and its interface with IPR is similar to that in major jurisdictions, namely that the law exempts necessary and reasonable conditions imposed in agreement with IPR holders to protect their rights. But there needs to be better balanced and more consultative mechanisms between the IPR regulators and the competition authorities, as two recent cases show. There is no jurisprudence as yet in terms of abusive conduct, but two cases have arisen. The first case involved discriminatory and exorbitant royalty rates for GSM technology patents. The rates were imposed on the product, not on the patent itself, and the holder subjected all its present and prospective clients to non-disclosure agreements. A second complaint involved the same company and similar allegations, so they were clubbed together, and the Director-General was instructed by the commission to investigate and relay his findings to the commission.

47. However, there was a judicial intervention from courts outside the statutory appeals process. The judiciary seemed to be concerned that there could be concurrent jurisdictions exercisable by both the IPR regulator and the competition authority, and in one case the court felt that this was re-opening the consent terms agreed to by the parties before the civil court. The courts granted a stay, the whole process at this stage is blocked and the investigation halted. This highlights the tension between the competition code and the IPR regime, and intervention by the courts makes it even more complicated. Stakeholders will intelligently seek the forum which best protects their interests.

48. The Chairman asked Maurits Dolmans, of Cleary, Gottlieb of London, for his observations on the valuation of patents and the fairness of the licence.

49. **Mr Dolmans** said that the EU Microsoft case was very interesting because the Commission suggested, and the courts agreed, that a company is not entitled to charge for the strategic value of a strategic asset, in that particular case confidential information and patents. The ruling meant that the value of a patent should be analysed on its own and that the patent owner cannot reap rewards related to the ability of the licensee to enter a neighbouring market. One can charge for the incremental value of the patent over the next best alternative, which has to be analysed on an ex ante basis before lock-in occurs, and that can be checked empirically. In that particular case, other technologies were available for free or for a very low royalty. So in practice, valuation is performed by looking at comparators, which was also the method followed in the United Brands case, and is currently being done in various pending FRAND cases. It would have been done by the German court in the Motorola Apple case had it not been settled out of court.

50. The Chairman asked the Japanese delegate to explain the guidelines there. They say that a patent holder that has participated in a standard-setting exercise and requests a very high licence fee, tantamount to a refusal to license, may risk violating anti-monopoly law. There are two questions. First, does this guideline apply even if the patent is not a SEP? Second, has the JFTC actually taken action in such cases?

51. The delegate from **Japan** said that yes, the guidelines apply to SEPs and non-SEPs. They have never had a relevant case, mainly because of a need to clarify what is meant by a very high licence fee. An important and possibly very influential case arose in May 2014 when Samsung sued the Japanese subsidiary of Apple, claiming patent infringement in a private litigation seeking an injunction and damages regarding a mobile telephony patent that Samsung declared as essential. The court declared that there was abuse to an extent of a rate exceeding a FRAND rate, and ordered Apple to pay a FRAND royalty rate. To decide what the FRAND rate should be, they first stated that the maximum aggregate royalty rate should be 5% of the sales volume, and then they calculated the proportion contributed by that particular standard, the UMTS (a number which remains confidential). They then assumed that all the SEPs that contribute to the UMTS standard are equal in value and divided the confidential number by the number of SEPs for the UMTS and came up with a FRAND royalty rate of ¥10 million, which was very much smaller than the amount demanded by Samsung. So this was not an anti-monopoly case but a private litigation, and the first in which a court gave their opinion on what constitutes a FRAND rate, and the decision will become a very influential one in similar cases.

52. The Chairman mentioned that Dr Layne-Farrar sitting beside him was startled because dividing the value by the number of patents was a procedure she had said was potentially misleading. Still, it is a procedure used by a court, and another one is that referred to by Maurits Dolmans, of looking at the ex ante alternatives. He asked a delegate from Korea to explain the Korean experience on this front.

53. A **Korean** delegate said that the Korean Fair Trade Commission (KTFC) had issued guidelines regarding improper exercise of IPRs in order to prevent competition law violations. Discriminatory conduct is considered to be illegal when competition is restricted, for example by excluding competitors. Three factors have to be considered: does the conduct maintain or reinforce market dominance; is the conduct intended to exclude competitors; and is the discriminatory conduct repeated. In the Qualcomm case, the KTFC concluded that the SEP patent holder had violated the Fair Trade Act through its dominant market position, and intended to exclude competitors and had granted licenses on discriminatory terms over a long period.

54. The Chairman asked Mr Dore if he had more details about the different interpretations given by firms participating in the ITU of what constitutes discrimination.

55. **Mr Dore** said that discrimination was an issue that came up very late in the ITU discussions. Some implementers complained that they had been unable to receive licences for certain standards, and wanted to know if this was permissible under ITU policy. Some stakeholders argued that it clearly should not be permissible, for if it were, there could be discrimination against chip manufacturers that produce in a certain market, or against SME implementers for example, whereas the ITU is trying to encourage SMEs to join the ITU. The counter argument is that SME chip manufacturers that are trying to obtain licences have never been sued by the patent holders, who provide access to the technology. So the issue is, is it sufficient under ITU policy to provide access to the technology by not suing a potential implementer, or should all implementers have the right to a licence irrespective of where they stand in the supply chain? For the moment the ITU has not arrived at a common position on this complex issue. The Chairman added that the ITU may have a definition of discrimination that differs from the way competition authorities usually interpret discrimination. Mr Dore responded that not only was this the case, but the ITU policy also differs from those of other international organisations. The non-discrimination issue is one for the ITU because of the way their policy was worded several years ago, but it might not be one for other SDOs where the situation might be clearer.

4. Should SEPs licensed on FRAND terms be immune to injunctions?

56. The Chairman said it was now time to turn to the issue of injunctions. As put by the US delegation, under which circumstances does the threat of an injunction tip the relationship between a SEP holder and a potential licensee who is seeking a licence. What are the limits that should be or could be made on the possibility of SEP holders to ask for injunctions? He asked Maurits Dolmans to give the Committee a general overview of the state of law and jurisprudence in that area.

57. **Mr Dolmans** began by saying that the situation is simple: a SEP holder promises to license the patent on FRAND terms. A potential implementer relies on that promise, they innovate using the standard that is incorporated in their product, they invest in production facilities and marketing, and they are willing and able to pay for the intellectual property of the SEP holder. The SEP holder should not then be able to take out an injunction unless they have an objective justification. Rather there should be private negotiation or recourse to a court or an arbitration tribunal. In various jurisdictions, potential implementers are opting preferably for negotiation, feeling that arbitration might go against them.

58. Of course, licensees should not behave in an opportunistic fashion and either delay negotiations or hold out entirely. In the EU, injunctions are normal, certainly in Germany and also the UK. In the UK Shelfer case, what mattered was not that the licensee was willing to pay, but that he did not have a licence. In that case, although the court ruled in favour of an injunction, it was tempered by equity principles, whether the injury is properly compensated by money. German courts issue injunctions almost as a matter of course.

59. The question arises whether injunctions are appropriate for a SEP. There are three concerns. First, a standard is akin to a collective boycott of alternative technologies, giving holdup power. Second, the value of a SEP is not just its incremental value, but the switching cost to a licensee that is locked in to the standard. Third, there is possible exclusion of competition in downstream markets. Based on these common sense considerations, the UK courts have started to take these concerns into account for example in the IPCom Nokia case. There, the judge argued that IPCom had promised to license on fair and reasonable terms, Nokia was willing to take a licence on those terms, so both parties were willing to agree, so granting an injunction would be extraordinary. The case collapsed for other reasons, but the courts are applying equity principles to get around the injunction problem, and this is permissible under EU patent law. Some Dutch courts have applied similar theory, but not in all cases, for example the Philips-SK Kassetten case. The criteria lead to the conclusion that a patent owner who has given a FRAND commitment, or a patent owner that is simply a patent assertion entity, is entitled to damages but not to an

injunction. In practice, universities and individuals still tend to get injunctions, perhaps for sympathetic reasons, companies less so, and in particular non-practicing entities or patent assertion entities which, in Mr Dolmans' view are a threat to competition and the patent system. There was also the judgement of Justice Posner in the Apple versus Motorola case, where each party sought injunctions against the other. Both were denied, one on FRAND, the other on equity grounds. Perhaps if he had granted both, the parties would have quickly sat down to negotiate their way out of mutually assured destruction.

60. Competition law is relevant in these cases. Setting a standard entails rejecting alternative technologies, which might sometimes be equally good, so there is a restriction of inter-technology competition. Second, the patent owner has significant increased power once the standard is set. Third, there is the possibility of holdup and restriction of downstream competition via restrictive licensing, and contrary to what Dr Layne-Farrar has said, one *does* see holdup, and situations where a company changes hands and steeply increases licence fees. In the Motorola vs. Apple case, there was a patent fight because Apple allegedly wanted to exclude Android from the market. In retaliation, Motorola sought an injunction on a SEP patent that was subject to a FRAND commitment, but the Commission ruled that this was an abuse of dominance. Against this, the advocate-general in the Huawei-ZTE case said that dominance cannot be assumed, the specific facts have to be examined. For example the other party might also have a large portfolio of patents and hence countervailing power.

61. There is also the question of what constitutes an abuse when an injunction is sought. Is it because the licensee has been led into a trap because of a promise on FRAND terms, or is it a means of enforcing the licence fees? The European charter of human rights gives everyone the right of access to the courts, so going to them and asking for an injunction cannot of itself be an abuse because the court can say no, you have the FRAND promise. But if you enforce the injunction by requiring the posting of a bond, that is where holdup can occur. In Europe, the rule seems to be now that one cannot get an injunction against a licensee who is willing and able to pay, though the definition of willingness is unclear and in the Huawei case a very strict timeline was imposed. Generally speaking, in Europe, the appropriate way is to negotiate for a certain time and if agreement cannot be reached, apply to the courts or an arbitrator to decide. Note that in Germany competition law can be relevant even for non-SEP patent cases, where FRAND does not apply, for example in the Orange Book case.

62. In conclusion, Mr Dolmans said that a licensor should not tie SEPs or non-SEPs, and should not impose a royalty fee cross-license for access to a SEP, and that these principles could be further developed in pending cases. He referred to the grid in his paper[4], based on current law, that allows one to decide whether or not to issue an injunction depending on the actions of the two parties.

63. The Chairman invited the US delegates to provide their views.

64. A **US** DOJ delegate said that they would discuss competition guidance on cases where holders of FRAND encumbered SEPs should be able to seek exclusionary relief from the US International Trade Commission (ITC). The ITC can impose an exclusion order if it finds that an importer is importing infringing goods unless public interest considerations counsel otherwise. The eBay standard for injunctive relief does not apply to the ITC. In January 2013, the DOJ and the US Patent and Trademark Office jointly published a policy statement on how the ITC should take competition factors into account when determining whether it is in the public interest to issue an exclusion order based on infringement of a FRAND-encumbered SEP. They argued that this could cause harm by facilitating holdup, and therefore may be inconsistent with the statutory public interest standard. The US Trade Representative cited this policy statement in a letter to the ITC in August 2014, disapproving an ITC exclusion order.

4 See DAF/COMP/WD(2014)83

65. The policy statement did nevertheless explain that ITC exclusion orders could be an appropriate remedy in certain circumstances such as where an implementer refuses to pay what has been determined to be a FRAND royalty, or refuses to negotiate the terms of a FRAND royalty, or if the licensee is not subject to the jurisdiction of a court that awards damages.

66. A **US** FTC delegate added that the competition agency certainly sees injunctions in this context as implicating competition law and are very concerned when companies go about seeking injunctions on SEPs. There are two avenues for obtaining injunctions. The first, as previously mentioned, is through the ITC to stop infringing products from being imported into the US. That was an avenue that many businesses pursued following the Supreme Court decision in the eBay case, which reversed a presumption that a patent holder would automatically get an injunction, and would be required to show irreparable harm. In the FTC view, when a company makes a FRAND commitment, this is strong evidence that it has determined that a damages award will suffice to protect its IP rights. Following the eBay case there was a move to use the ITC to obtain injunctions, because those are their only relief. The DOJ and the FTC contributed statements to the ITC arguing that exclusion orders should not be automatic in SEP cases.

67. There has also been enforcement in this area. In the Google MMI case, the FTC found a violation of antitrust laws when Google sought an injunction on its cell phone Wi-Fi patent despite a commitment to license it to willing licensees. Even after its acquisition of MMI, Google continued this conduct and the FTC entered into a consent order whereby Google agreed to resolve any FRAND-related disputes before a neutral party before seeking an injunction. However an injunction would be permissible if the potential licensee refused to be bound by the neutral party decision, or would not be subject to the jurisdiction of a US court.

68. At the invitation of the Chairman, an **EU** delegate explained[5] that standardisation is a major issue on the Europe 2020 agenda. Previous speakers had covered the benefits of standardisation and also its downside, the risk of collusion, and the absence of competition once the standard is decided upon. There has been a big increase in patenting, a tripling in the US since the mid 1980s, and also an increase in the number of SEPs. There are various reasons for this, and probably the number of patents that are declared as SEPs is greater than the number of patents that are actually standard essential. If you ask industry people how many standards are embedded in a device, they will say that they do not know. According to a study mentioned by Mr Dore there are at least 250 interoperability standards for a modern laptop, and nobody knows how many patents there are actually standard essential. It is said that there are about 100,000 patents in a smartphone, of which perhaps 20,000 are SEPs, but if you prevail on one claim of one patent, you will get your injunction.

69. The EU does not assume that whenever there is a SEP there is market power, everything depends on the standard in question. For example it was the 2G standard in the Motorola vs Apple case, a standard that is implemented in all mobile phones in the EU. In that case, Motorola sought and enforced an injunction obtained before the district court in Mannheim for 2G SEPs for which they had in fact given a FRAND commitment. In all, Apple made 6 offers, eventually giving up their right to challenge validity and infringement of the entire German SEP portfolio. After their second offer they agreed that the court should set the FRAND rate, and the Commission took the view that Motorola should no longer request an injunction. The Commission was also very concerned about the chilling of the entire portfolio, and when Samsung sought injunctions in several EU states for its 3G SEPs, it withdrew them after the Commission signalled its objection, and agreed not to seek injunctions as long as there were willing licensees. If negotiation fails, then a third party, arbitration or the court, will set the FRAND rate. The Commission strives to strike the right balance between IPR and competition law, in that SEP holders should be adequately remunerated with their FRAND commitment, and there should not be recourse to injunctions.

[5] See also: DAF/COMP/WD(2014)117

A company might contribute its patent just in order to make money on the licensing, but a DG Enterprise study showed that monetisation is rather far down the list of reasons why people engage in standard-setting organisations.

70. The reason the Commission felt obliged to intervene in some cases is because national courts' views differ on how to deal with the issues. The question is whether there is an intellectual property right, under which law, should there be a proportionality test, or equity at least, and also the application of competition law. There is a lot of uncertainty and this ultimately resulted in the Huawei – ZTE case pending before the court of justice. Germany accounts for about 60% of patent litigation and a recent study found that 44% of the patents litigated between 2010 and 2014 were entirely valid and 35% partially valid. So the Commission is not saying that injunctions should be off the table, they are generally a legitimate recourse, but it is different when there are SEPs, an injunction is potentially anticompetitive. Standardisation creates an anticompetitive context by excluding competition, and the quid pro quo is the FRAND commitment.

71. The Chairman asked the German delegation to explain why the German courts so readily grant injunctions.

72. A delegate from the **German** competition authority agreed that there is a lot of patent litigation in Germany, but this is because there is a well-established court system with specialised chambers that have a long tradition of, and confidence in, granting injunctions. There have been complaints that the Orange Book judgement may not be appropriate to SEPs, and it would not be in the public interest if the validity of patents cannot be challenged. They have considered opening proceedings along the same lines as the Commission, but should they be on the grounds of excessive pricing: previous speakers have noted the difficulty in calculating FRAND rates. Should there be limits on the possibility to grant injunctions? They were not sure that it was the role of the competition authority to intervene. Complainants open negotiating procedures, the courts work quickly and at reasonable cost, and the results seem to be fair. Although they feel that injunctions are fair and necessary for both sides, they very much welcome recent Commission case law and the referral to the European Court of Justice to receive some guidance on how the negotiating balance should be put in practice. Issues such as inability to pay need more reflection. One should not push the negotiating power too much to one side by setting the threshold for willingness to negotiate or agree on FRAND terms too low.

73. The Chairman invited comments from Finland and Italy.

74. In the Huawei vs ZTE hearing, **Finland** suggested that the seeking of an injunction could be a constructive refusal to license if a SEP holder gave a FRAND commitment but refused to license on FRAND terms. Holdup is sometimes examined in the light of criteria for refusal to license, and SEP-based holdup could fulfil the criteria under exceptional circumstances in which consumer welfare is threatened. But often there is neither outright nor constructive refusal to license, but rather a refusal conditional on accepting a certain level of royalties.

75. An **Italian** delegate commented on the Italian decision in the Samsung vs. Apple case. A specialised Milan court denied a request by Samsung for an injunction on the grounds of a balance between the conflicting interests of the two parties, and taking consumer welfare into account. It was determined that preventing the sale of Apple mobile devices at Christmas time would have greatly harmed the company and consumers, while the economic prejudice to Samsung could be compensated at the end of a trial.

5. Co-operation between competition authorities, patent offices and standard setting organisations.

5.1 Intervention by the European Patent Office

76. The Chairman asked Dr Theon Van Dijk of the EPO to provide views on how there could be more co-operation between competition authorities, patent offices and standard-setting organisations.

77. **Dr Van Dijk**[6] said that patent offices by themselves cannot solve the problems of SEPs and FRAND, but they can help by providing expertise to the competition authorities. There are 5 possible areas: first, patent officers can provide expertise to the competition authorities; second, it can assist those authorities on how to use the public patent databases; third, patent officers could provide expert advice to consultations on new competition regulations related to patents; fourth, patent officers can and do co-operate with SSOs to assess the patentability of certain inventions, concretely by assessing prior art; fifth, technical assistance by patent officers to assess the essential nature of certain patents for standards.

78. As an example regarding the first area, an EPO patent examiner was seconded for 7 months to a DG competition team to assist them in a pharmaceutical enquiry in 2008-2009. There was a question of whether there were delays to generic market entry caused by originating pharmaceutical companies. This type of assistance is possible in other patent-intensive industries such as ICT.

79. For the second area, the EPO has a number of databases. There are free online search tools to interrogate them, and the Vienna team can assist those who wish to use them. In a competition case, the data could help to assess the size of a patent portfolio, its structure, country coverage, which technology fields are covered, in which countries the patents have been validated and for how long, and the strength of a patent portfolio.

80. In the area of competition regulations, issues of technology transfer block exemptions, horizontal agreements, regulation verticals and Article 82 all involve patents, and patent experts can offer advice when drafting those regulations, in particular regarding dynamic efficiency and its role in innovation.

81. As regards prior art, there is a grey zone between publicly available and non-publicly available information. In the standard setting process, information is shared and is not confidential, and disclosure of technology in the SSOs forms part of the prior art. The EPO has agreements with some SSOs, including the ITU, by which the latter have access to standards-related documents, of which there are 1.6 million. The EPO examiners can do a better job in assessing novelty and prior art, raising the quality of patents that are granted, and giving them a better chance of standing up in court if their validity is questioned.

82. Finally, patent officers can give technical help in SEP cases, not from a competition viewpoint, but by assessing whether a patent is truly a SEP, or is no longer one, or has become one. Also a patent consists of a number of claims, not all of which might be essential to a standard. Hence an EPO examiner could argue that a patent is not essential and there is no SEP case.

5.2 A legal viewpoint

83. The Chairman thanked Dr van Dijk for his intervention, and called on Mr Dolmans for a legal assessment of whether there are relatively simple ways to improve or facilitate co-operation.

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6 See also http://www.slideshare.net/OECD-DAF/ip-standard-settingtheonvandijk17dec2014

84. **Mr Dolmans** said that the standards bodies should be encouraged to fix or implement the principles that are emerging from this discussion. The IEEE has already started, it is somewhat controversial, but it could be done for example by requiring members of SSOs, pursuant to their IPR policies, to negotiate terms for a reasonable time period, 6 or 12 months, then submit to arbitration. The arbitration provisions could be provided by the SSOs themselves, such as that of the Digital Video Broadcasting SSO. WIPO has a helpful process for IPR arbitration, with knowledgeable experts.

85. In addition, SSOs could clarify what is meant by FRAND, for example it is not FRAND to tie SEPs to non-SEPs, and to insist on a portfolio licence rather than offering one. Similarly, it is probably not FRAND to require a licensee to cross-license its IPRs for free, or at below-FRAND terms, as opposed to giving the licensee the option to do this, provided there is some kind of minimal reciprocity. The competition authorities can nudge SSOs to modify their IPR policies because there are implications for competition in the work they do, and therefore the SSOs should at least allow intra-technology competition in products implementing the standards.

86. Dr Layne-Farrar intervened to agree that the SSPOs should take the lead, she thought they already were doing so, not just the IEEE but also the ITU and others. They are modifying their IPR policies to reflect the debate, and each body is different, which is why one wants just a nudge from the competition authorities: one size does not fit all.

5.3 The BIAC viewpoint

87. At the invitation of the Chairman, the **BIAC** delegate took the floor, saying that the reason why the topic gets so much attention is because it is interesting and difficult, but perhaps the level of attention exceeds the scope of the problem.

88. BIAC has members who are inventors who want to collect a lot of royalties, and members who are implementers who do not want to pay the royalties demanded. So there are commercial disputes over what are essentially executory contracts: the invention has been made as has the implementation, so the question is: what is the fee for a contract that has already been executed by both parties? Of course, one could negotiate in advance, but this would greatly delay the innovation and its implementation, so the disputes are perhaps a small price to pay for all the innovation from which we benefit.

89. The system usually works: some disputes have attracted a lot of attention, but mainly because they are between big players, and in most cases the licensing system works well. The fact that the ICT market has grown so rapidly shows that the problems are not systemic. The ultimate question is when should competition authorities intervene, and the answer is when there is harm to competition, not harm to competitors, but it is difficult to identify the facts and circumstances in those cases. There are two instances where the facts are important, one is exclusionary abuse arising from injunctions and the other is exploitative abuse.

90. Of course patent holders cannot unilaterally issue an injunction, they have to go before a court, the courts have to decide if the patents are valid and infringed, and if there is some higher level of harm. In the US it is irreparable harm, in the EC it is often insufficient monetary awards, but courts now more often take into account FRAND issues, so increasingly the requirement of an unwilling licensee enters into the judicial determination of whether an injunction is appropriate. In the history of the smart phone patent wars, injunctions have been extremely rare, one exclusion order and no injunction in the US (and the exclusion order was withdrawn on executive order), and 6 in the EU none of which lasted more than a couple of days.

91. The threat of an injunction is only as credible as the ability to obtain one, and to enforce it, and that threat has diminished over the past 5 years because of guidance by the courts and by the competition agencies. The burden is now higher and BIAC agrees that the burden on getting an injunction should be high. It should not be impossible, however. There may be circumstances that warrant an injunction even in the context of a FRAND commitment

92. Another potential for exclusionary abuse is fraud in the standard setting process for example when a patent holder knowingly withholds information and refuses to make a FRAND commitment. This is an area where theory and facts do not always align. Theory assumes that alternatives exist, or could have done so, but one often sees that the disputed technologies are incorporated into the next versions without objection even by those who disputed the validity of the patents. So perhaps there are not always alternatives. Another example is the view that it is necessarily fraudulent not to disclose a patent. The problem here is that a company may have a portfolio of thousands of patents, is adding to them all the time, and may not know which are linked to a particular standard which is implemented before the company is aware that it owns relevant patents. In many cases, inventors with portfolios issue a blanket commitment, saying that they do not know if they have SEPs, but if they find that they do, they will accept FRAND, so there is no fraudulent behaviour even if their SEPs come to light after the standard is set. Of course, there should be a higher burden if the company is the one proposing the standard.

93. Exploitative abuse can arise in only two scenarios. One is where there is an agreement on the rate, a high one, and the implementer pays, so it is hard to define this as abuse. All other scenarios involve adjudication. No money changes hands until the court decides on how much it should be, so that if it is regarded as abusive, it has nevertheless been sanctioned by the court. Should competition authorities intervene? BIAC thinks that they should remain cautious and prudent, and that any actions taken should be based on the ascertainable facts of the case, not on theoretical considerations. So if the disputes are before the courts, and are guided by patent officers, that strikes the right balance and the competition authorities should be watching, but be prudent in acting.

6. Concluding remarks

94. The Chairman thanked BIAC for a very reasonable and well articulated point of view. In conclusion he said that the meeting had succeeded in clarifying several issues. The first one, raised by Norway, was the valuation issue. There were also good ideas from the experts on how competition authorities, standard setting organisations and patent offices could best work together. The Chairman supported Maurits Dolmans' intuition that everything should be done to reduce strategic behaviour by requiring the SSOs to be more precise and exact in the constraints they impose on the patent holders of the standards they put together. If they follow this path, there would be fewer occasions when the competition authorities would have to intervene or provide guidance. His feeling was that the competition authorities are not particularly comfortable or competent in intervening on these occasions, and they would prefer that the conflicts do not arise in the first place.

ANNEX

List of abbreviations

EPO	*European Patent Office*
ETSI	*European Telecommunications Standards Institute*
FRAND	*Fair, reasonable and non-discriminatory (licensing terms for SEPs, also referred to as RAND in some countries)*
HTTP	*HyperText Transfer Protocol (standard protocol to permit communication between two computers over the internet)*
ICT	*Information and communications technology*
IEC	*International Electrotechnical Commission*
IEEE	*Institute of Electrical and Electronic Engineers*
IETF	*Internet Engineering Task Force*
IP	*Intellectual property*
IPR	*Intellectual property rights*
ISO	*International Standardisation Organisation*
ITC	*International Trade Commission (US)*
ITU	*International Telecommunications Union*
JFTC	*Japanese Fair Trading Commission*
KFTC	*Korean Fair Trading Commission*
SDO	*Standard Developing Organisation (also SSO, Standard Setting Organisation)*
SEP	*Standard-essential patent*
TCP/IP	*Transmission Control Protocol and Internet Protocol (Standard protocols to direct transmissions over the internet)*
US DOJ	*United States Department of Justice*
US FTC	*United States Federal Trade Commission*
WIPO	*World Intellectual Property Organisation*
3GPP	*3rd Generation Partnership Project*