23 Avenue Marnix - 1000 Brussels - Belgium
T. +32 (0)2 289 0802
information@fair-standards.org

www.fair-standards.org

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Competitive and Industry Harms Related to Refusals to License SEPs and Other Forms of "Level Discrimination" in SEP licensing

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1. Introduction: Refusals to License SEPs Harm Industry and Innovation

Companies that create devices supporting current and next-generation cellular and Internet of Things (IoT) applications are, and will continue to be, critical to the innovative development of the connected economy. Licensors of FRAND-encumbered standard essential patents (SEPs) must be willing to offer licences to their SEPs to all entities in the supply chain, including component manufacturers, that use the technology standards. This requirement is particularly critical for wireless communication standards, where standardized functionality is provided by a small number of component suppliers, and then integrated into thousands of different types of downstream devices throughout many different industry and economic sectors.

However, in violation of applicable law and the requirements of their FRAND commitments, some SEP holders refuse to grant licences to component manufacturers. In this paper, the FSA highlights some of the harms that result from the refusal to license both semiconductor companies that manufacture cellular chips, as well as module manufacturers that develop and sell components incorporating those chips.

2. The Internet of Things and Technology Standards

IoT is enabled by chips and modules that provide standardized functionality. Cellular chips are specifically designed to support their use. Cellular modules provide the next level of integration. Such modules typically are small "systems in packages" (SiPs) that include cellular chips along with other technologies, for example GPS, to make those chips easier to use and integrate into downstream products. As the connected economy moves forward, everything from medical equipment, ovens, thermometers, lighting, cars, smart meters, tracking devices for pets and farm animals, pallets, containers, trash cans, and post boxes will be connected to the internet using these cellular chips and modules.

Cellular devices, including IoT components, operate using standardized radio communication technologies. While everyone today is familiar with traditional cellular devices, such as phones and tablets, a new generation of cellular IoT standards is just beginning to flourish. With the launch of the fourth generation (4G) of radio technologies, two new technology standards were introduced that allow all sorts of devices to communicate directly over the internet. These new standards – known as LTE-M and NB-IoT – function so that communication no longer needs to be routed via a mobile phone.

Instead, a heart rate monitor that previously provided information to the user's mobile phone via Bluetooth may now connect directly to the nearest base station, and from there the data can be routed wherever the user might want it to go, whether it be to the user's doctor, the user's phone, or a social network.

Likewise, IoT may enable safety devices such as connected clothing. With smart footwear, for example, should the user fall or have an accident while hiking in the forest or in the mountains, a GPS tracker in the integrated cellular module can send a signal to alert authorities to send medical assistance. These cellular components may also be able to detect wildfires in forests and rural places before they expand because of the components' capability to measure temperature, humidity, and movement, as well as location finding through GPS.

Because cellular technologies already have a robust infrastructure for long range communications, their use in these types of IoT devices can significantly expand the potential use cases.

Indeed, 4G IoT is just the beginning. As the 5G radio technologies using new radio frequency bands are rolled out, even more Internet connected devices will enter the market. The connected future will broadly impact consumers and national economies, from simplifying our daily tasks to introducing great environmental and cost-reducing benefits through reduced pollution, water, gas, and electricity consumption[1].

3. SEPs Subject to a Voluntary FRAND Commitment Must be Available for Licensing

To enable communication over 4G/5G networks, microchip manufacturers implement connectivity standards such as the NB-IoT and LTE-M, both radio connectivity standards developed by the standard setting organizations (SSOs). Complicated technology standards, such as cellular standards, can use many thousands of patented inventions. Such necessary patents are referred to as standard essential patents (SEPs). "A patent is essential to a standard if the standardized technology cannot be used without using the teachings of the patent, thus infringing the patent."[2]

If SEP owners could refuse licences to their patents, or could only offer licences on unreasonable terms, the standard could not succeed. Recognizing this risk, as part of the standardization process, contributors to the standard commit to license their SEPs on "fair, reasonable and non-discriminatory" terms.

> Because the core objective of standardisation is the wide-spread adoption of the technologies it describes, participants in most standards-setting organisations voluntarily agree to grant licences to their SEPs on "Fair, Reasonable and Non-Discriminatory" (FRAND) terms. These FRAND commitments accomplish two goals: Firstly, implementers of a standard can feel secure that they can get licences on fair and reasonable terms, and secondly, the SEP holders can receive appropriate remuneration for their patented inventions.[3]

The 3GPP, an organization that oversees development of cellular standards, publicly represents that "[a]ll Individual Members of 3GPP abide by the IPR policies of the [3GPP-member SDO] to which they belong; all such policies are broadly similar … and require IPR holders to make licences available to all third parties, whether or not they are 3GPP Individual Members, under fair, reasonable and non-discriminatory (FRAND) terms."[4] It therefore follows that the obligation to license on FRAND terms is a binding commitment on which component manufacturers, and everyone else in the supply chain who uses technology

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[1] Svein-Egil Nielsen, *The invisible IoT revolution*, https://internetofthingsagenda.techtarget.com/blog/IoT-Agenda/The-invisible-IoT-revolution.

[2] Inger Berg Ørstavik, *Article 102 TFEU and the Enforcement of Standard-Essential Patents. The Huawei Decision in a Contract Law Perspective* (2017) , http://urn.nb.no/URN:NBN:no-67600 [hereinafter *Article 102 TEFU and SEPs*].

[3] Fair Standards Alliance An Introduction 2 (12 Nov. 2015), https://fair-standards.org/wp-content/uploads/2016/08/FSA-POSITION-PAPER-June2016.pdf.

[4] 3GPP FAQs, *What is the 3GPP policy on licensing?*, https://www.3gpp.org/contact/3gpp-faqs#L5.

standards, must be able to rely. Indeed, developers of these components practicing the standard, i.e., chip and module manufacturers, are heavily involved in and contribute greatly to the standard setting process. In turn, these component companies –that promise to license their own SEPs on FRAND terms – are entitled to rely on the promise and commitment from their fellow companies such that they likewise will be able to obtain a licence on FRAND terms.

Similarly, downstream customers that purchase standardized components must be able to rely on their suppliers' ability to obtain a direct licence. It would, of course, make little sense to force manufacturers of smart hiking boots, heart monitors, or ovens to investigate and negotiate complex licences with cellular patent holders. Instead, their suppliers using those standards can negotiate a licence that covers their business as well as all of their customers' businesses.

ETSI is one member of 3GPP, such that its policy must conform with the 3GPP requirements noted above. And indeed, likewise under the ETSI IPR policy, SEP owners must promise to be "prepared to grant irrevocable licences on fair, reasonable and non-discriminatory ("FRAND") terms and conditions."[5] This promise creates a legitimate expectation on behalf of all third parties that a licence can be obtained and that the terms will be FRAND.[6]

In addition, gathering SEPs into a patent pool for licensing purposes does not change the licensing commitment made by the pool's licensors. A patent pool should, therefore, also comply with the basic principles of FRAND licensing. Accordingly, a patent pool licence should also be made available to any entity within a supply chain that practices the standard and seeks a licence. Otherwise, the patent pool will be a mechanism for the owners of FRAND-committed patents to seek to avoid that commitment by refusing a 'pool' licence to component manufacturers.[7]

4. Consequences of Refusals to License and "Level Discrimination"

Unfortunately, in violation of these applicable licensing commitments, some SEP owners have recently begun to claim that they need only licence companies that make end-products, such as smartphones, hiking boots, cars or smart meters for gas, water and electricity. This is a new development, which contradicts those same SEP owners' prior practices and statements, and which is gravely harming the development and roll-out of IoT.[8]

These improper practices cause significant harm and create costly challenges throughout the supply chain. In this illustrative paper, we will highlight some of the concerns and challenges

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[5] Annex 6, ETSI Intellectual Rights Policy §6.1 *Availability of Licenses*, (Dec. 4, 2019), https://www.etsi.org/images/files/IPR/etsi-ipr-policy.pdf.

[6] Case C-170/13, Huawei v. ZTE (Huawei), ECLI:EU:C:2015:477 para 53; *see also* Fair Standards Alliance, *Position Paper - SEP Licenses Available To All* (June 24, 2016), https://fair-standards.org/wp-content/uploads/2016/09/160624_FSA_Position_Paper_-_SEP_licenses_available_to_all.pdf.

[7] Fair Standards Alliance, *Patent Pools and Licensing platforms in SEP Licensing* (Nov. 6, 2019), https://fair-standards.org/wp-content/uploads/2019/11/191104_FSA_Position_Patent_Pools.pdf.

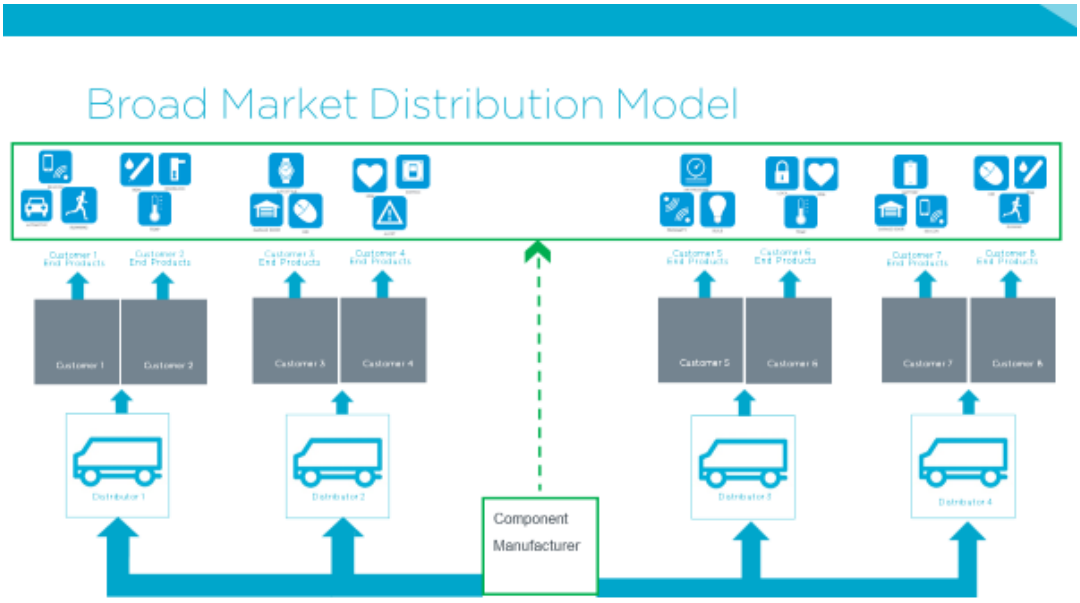
[8] See Fair Standards Alliance, *SEP Licenses Should Be Available To All Companies In A Supply Chain That Want A License For Seps In Their Products – Supporting References* (June 8, 2020), https://fair-standards.org/wp-content/uploads/2020/06/200605-FSA-Position-Paper-Supporting-Legal-and-Policy-References-Licence-to-All.pdf.

component manufacturers face due to these improper and abusive licensing practices. The negative consequences for the European economy include severe impacts on innovation and the roll-out of IoT in Europe. As an example, one can look at a component manufacturer that makes a module implementing NB-IoT and LTE-M standards.

4.1 Refusals to License Undermine Established Ecosystems

Consumers will benefit from IoT technologies in myriad ways – for example, so that they can start pre-heating the oven on the way home from work, or have the lawnmower tend to their garden grass while they are at work. In fact, we have now come to a point in time where consumers expect many common devices to be "smart." The estimated number of IoT devices varies, but according to one major SEP licensor there will be 24.9 billion connected devices in 2025.[9] The components which enable these devices are all largely the same; the IoT chip that goes into a smart oven is either the same or substantially the same as the IoT chip that goes into a smart meter. The standardized functionality is the same, and then the downstream company decides how to innovatively and usefully use that functionality in its own products.

With such rapid growth, a component manufacturer's business model is highly dependent on a broad, world-wide third-party distribution network where component manufactures do not interact directly with most customers, having few if any direct contacts with the original equipment manufacturers (OEMs). Ordering, delivery and payment are routed through such third-party distribution networks, creating substantial efficiencies for both suppliers and customers. With this business model, the component manufacturers can reach every corner of the world from small start-ups to the major consumer OEMs. The component manufacturer establishes framework agreements (agreements that allow for expeditious ordering of goods by setting contractual terms for a defined period of time) with the distributors. They, in turn, have framework agreements with their own downstream customers and OEMs. These relationships are shown in Illustration 1 below.



[9] IoT, The Internet of Things, https://www.ericsson.com/en/internet-of-things.

Illustration 1: *A licensing practice where SEPs are licensed at the component level would reach downstream buyers and users that buy and use cellular products, and the component manufacturer would be able to pass those licence rights down the supply chain. The number of chips and module makers practicing standardized cellular technology is limited compared to the tens of thousands of companies that want to enter the IoT with new gadgets. This licensing model massively reduces the cost of transactions between the SEP owners and the licensees. When everyone in the value chain is licensed through the component manufacturer, the number of litigation cases will decrease, and so will the companies' litigation costs. And the technology companies that drive the future of IoT by making smart devices can spend their time innovating and developing new products instead of negotiating licenses to the patents necessary to use communications standards, a practice for which they have no prior expertise or experience.*

4.2 Refusals to License SEPs Hamper Competition

From a competition law perspective, the problem with selective licensing for the component manufacturer is that some SEP owners decide which companies to license, and thus decide which companies are "allowed" to compete effectively in the market. Although technology standards offer clear advantages, such as world-wide adoption and interoperability, practicing a standard is also often necessary to enter a market. For IoT, component manufacturers must certify that their modules conform to NB-IoT and/or LTE-M, and that they do so by carrier certification. "With regards to the SEPs there is no alternative technology to the teachings of the SEP. This technological dependence translates into economic dependence."[10]

By choosing the companies in the value chain to whom they will offer a licence, SEP owners decide which companies can effectively compete in the marketplace, and how their innovation and R&D investment can be spent. The SEP owner holds a patent monopoly on a technology that is not licensable from anyone else, that is needed for entering the IoT market, and for which the threat of exclusion (e.g., via enforcement action for an injunction) would create extraordinary bargaining power. To leverage this market power, some SEP owners unfairly seek to license and collect royalties only at the OEM level, where companies are unable to switch standards once the supporting NB-IoT and LTE-M components have been designed into their products. But according to Ørstavik, these communication standards should benefit competition and the consumers, not unjustly enrich one patent holder beyond the value of its SEPs *"as the objective of the standard is to facilitate new technology at a lower cost to the market."*[11]

4.3 Refusals to License Hamper Innovation

Semiconductor companies benefit from the growing importance of environmental, social and governance issues because their technology enables customers to develop end-products and solutions that benefit society and reduce energy consumption. In addition, semiconductor technology enables smart healthcare technology, such as live temperature measurement– helping in the detection, prediction, and tracking of disease, for example, Covid-19.

[10] Ørstavik *Article 102 TEFU and SEPs* , *supra* note 2, at 3.
[11] Ørstavik *Article 102 TEFU and SEPs* , *supra* note 2, at 14.

Delayed roll out of IoT will delay important technology developments that have great environmental benefits. The IoT sensors that measure temperature and humidity in smart green houses will save water and electricity. The same sensors implemented in trash cans and mailboxes enable energy saving when the garbage truck drivers know which trash cans to empty while lighting sensors in buildings saves electricity. But where the necessary SEP licences are unavailable to semiconductor suppliers, their customers are hampered in building these businesses or facilitate these downstream uses for their products. So, for example, the smart watering customer is hesitant to purchase components without the SEP rights included as part of the sale when faced with a potentially complex landscape of patent risks outside of its own technology competences. The uncertainty could drive the smart watering customer to buy components that use another competing technology.

4.4 Refusals to License Hamper common industry-practice Supply Terms

In a number of industries, it is common, in the contractual relationship between a component manufacturer and a customer, that the component manufacturer indemnifies its customers for patent infringement of third-party intellectual property rights (IPR), which often mean agreeing to support defences against infringement litigation and to reimburse customers for any damages and costs. Absent a contract, indemnification is a default legal obligation in most countries, such as those that adopt the Uniform Commercial Code and its associated warranty of non-infringement for commercial sales. In short, component manufacturers may be expected to provide necessary third-party IP rights to sell their products, which is natural as the component manufacturer knows the product it produces and what standards it implements.

But if a component manufacturer is not able to obtain a licence, the component manufacturer will become unable to provide the expected warranties of non-infringement and, practically, must disclaim such indemnification. This change in practice disrupts established norms in many industries and harms efficiencies in the supply chain. See illustration 2, below.

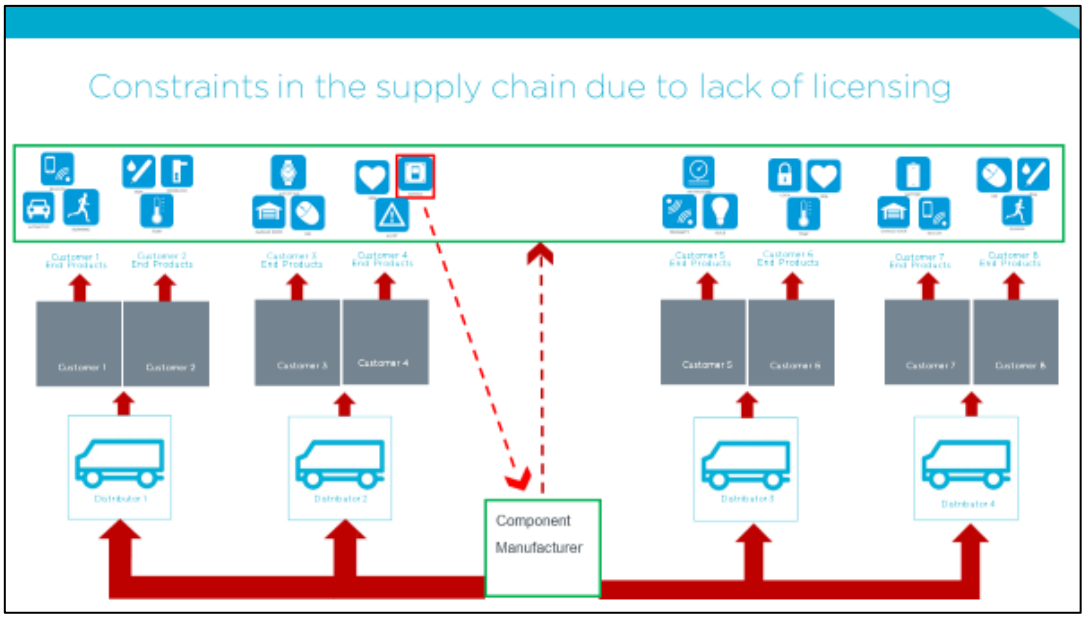


Illustration 2: *If a component manufacturer is not able to obtain a licence, the component manufacturer cannot provide any warranties of non-infringement and, practically, cannot offer an indemnification to distributors or directly to any OEMs. Well-established distribution agreements must be re-negotiated, and some OEMs may not accept new terms. Some component manufacturers still offer indemnification without access to licences, forcing other component manufacturers unable to accept such risk out of the market.*

The illustration also shows that "have made" rights only cover one type of end-product, leaving thousands of components un-licensed as explained in section 5, below.

Moreover, component manufacturers operating under existing contracts that historically have followed the industry practice of extending indemnifications to their customers for all third-party IP may now be faced with excessive indemnity claims for SEPs they are not able to license directly. This situation is unfair and inefficient. The parties that are most knowledgeable about the technologies their products support are precluded from negotiating the commercial licensing terms. Further, it creates a system in which a SEP licensor that sues multiple OEMs for buying an allegedly infringing third-party component from the same manufacturer indirectly obliges that manufacturer to reimburse, negotiate, and possibly litigate multiple times to procure a series of identical licences, one for each OEM. Again, the disruption to existing business models and supply chain norms undermines the ability of suppliers to support and expand IoT businesses.

5. "Have made" rights are no substitute for a licence

Some SEP owners claim to provide "access" to their SEPs to component manufacturers by licensing the downstream OEM through "have made" rights, the right of an entity to hire a third-party to make a licensed product for it. They argue that the component manufacturers do not need a licence, because they are providing "have made" rights to the component manufacturers' customers. "Have made" rights are not a substitute for a licence.

For example, relying on a customer's "have made" rights does not give the component manufacturer control of the licence. That manufacturer could easily end up selling unlicensed products if any of its customers breach the terms of their licences and any one SEP owner were to terminate the licence in response to that breach. Also, a licence to component manufacturer's customers does not give the component manufacturer "freedom to operate." It only means that the manufacturer can sell OEM designed components to licensed customers. This restriction raises component manufacturers' costs by destroying their economies of scale dissuading them from innovating and suggesting unlicensed new uses or designs to downstream innovators. In short, a "derivative" licence depending only from a few customers in a few industries is no substitute for a full licence protecting the full existing and prospective business of the supplier. Moreover, it is not clear that all customers of component manufacturers could even get a "have made" licence. For a semiconductor company that produces hundreds of millions of chips and modules per year, only a tiny fraction of the component manufacturer's customers would be granted "have made" rights. There will be tens of thousands of customers that are not licensed because the customers only produce a relatively small volume of products and the cost of executing a licence would be greater than the royalties the SEP licensors would collect.

Finally, some SEP owners price discriminate based on the use of the end product, requiring that every new product that is developed be covered by a new licence at a new rate with its own "have made" rights. Doing so is simply not achievable, so it "freezes the market;" by allowing only known customers and applications to be licensed. This practice raises other concerns as well. It means that small to medium enterprise (SME) device manufacturers and users will have to disclose to the SEP holders their confidential plans and trade secrets for every new product idea or use case, which creates incentives for abusive conduct by SEP holders. In addition, SEP holders would likely seek higher licence fees for more innovative products that are new to the market and thus tax the innovation of the SMEs in Europe and elsewhere.

6. OEMs Are Harmed By Refusals to License Component Suppliers

OEMs also are harmed when SEP owners refuse to license component manufacturers and consequently are unable to guarantee their customers that their cellular products come with the rights to practice all third-party patented inventions incorporated in them.

When the end-device manufacturer is not able to purchase components with licences to applicable SEPs, it must take on those licensing obligations itself. In other words, the end-device maker (whether a maker of hiking boots, smart ovens, or other "smart" products that incorporate standardized components) must now take on the obligation to develop expertise on connectivity standards and patents so that it can evaluate licensing proposals. It is inefficient to require that the end-device makers undertake such responsibility for technologies provided by their suppliers about which they are unfamiliar.

Customers might therefore choose component manufacturers who, regardless of not having all licences to SEPs in place, offer indemnification. This practice creates an unlevel playing field for SME component manufacturers. They cannot take on such contractual and financial risk (which may cause bankruptcy if the component manufacturer is unable to obtain reasonable licensing terms), while a large and vertically integrated global player might be able to leverage its much greater resources to obtain preferential terms.

7. Royalty base

SEPs should be valued based on the relevant device that uses the patent. The chip or module produced by a semiconductor manufacturer— not the end-product incorporating additional technologies— may well be the smallest component that directly or indirectly infringes the SEP. It would be manifestly unfair for a component manufacturer to be subject to claims for infringing an SEP while simultaneously being unable to obtain a licence. As such, those component manufacturers who are willing licensees, and willing to pay royalty rates on FRAND terms, based on the value of the technology that the component they manufacture incorporates, should be granted a FRAND licence.

SEPs relevant to 4G/5G communication standards are addressed to communication techniques and protocols. Such SEPs generally do not claim the actual use of end products. Rather, they claim discrete functions enabled by particular components incorporated in end

products, such as chips. For example, the ability to cook food in an oven with high temperatures has nothing to do with connectivity to the internet. Consumers pay more for improved displays, storage, or facial recognition in cell phones, technologies that are completely unrelated to standardized communication technologies. Moreover, the communication technology remains the same whether it is used in a mobile device, an oven, a lawnmower, or a pair of hiking boots.

Some SEP owners try to justify their licensing practices by indicating that the end-device exercises more of the patents in the standard than the component. But, SEPs generally are use-agnostic – they describe the communication protocols, but do not specify the content of those communications (i.e., "turn oven off" vs. "tell car to slow down"). As such, an SEP owner that seeks compensation based on end-use values is in reality seeking compensation for the value-added by the work or contributions of downstream OEMs. SEP owners – if they had a novel downstream invention – always would be permitted by the patent laws to seek a patent on an entire end-device (such as a metering device for water, gas or electricity), rather than on the connectivity standard itself. But if the SEP owner has foregone such opportunity to obtain a downstream patent, it should not be treated, counter to reality, as if it had obtained such a patent. Licensing end-products only, inappropriately "permit[s] SEP owners to capture the additional value created by the standard-setting process itself" in addition to "value created by those who incorporate upstream, standardized components into downstream products and services."[12] This extraction of royalties is wholly unattributable to the patented invention. Such an approach would lead to over-compensation and harm the innovation cycle by discouraging businesses from developing and marketing new and valuable uses for standardized technologies.

Further, basing the royalty on the end-product conflicts with established business models utilized by component manufacturers, i.e. the sales through distribution at common prices regardless of end uses. Semiconductor companies have thousands of customers, who order products and delivery through this well-established world-wide distribution network. Therefore, in most circumstances, semiconductor manufacturers do not know where their products end up, and in what type of end-product the module is incorporated, unless they assist through technical support or interact with the customers in the design phase. Moreover, these modules with radio communication are application agnostic, meaning that the exact same module is used in a great number of different devices.

When the cellular modules are application agnostic, they are also sold at a flat rate, independent of the end-device. such as an asset tracker. The same asset tracker can, for example be used on a cow, a pallet, on sheep, reindeers, expensive purses, equipment and heavy machinery, mountain boots, and alpaca. The price of the end product may vary, but the function of the component does not. "Allowing SEP owners to differentiate between applications of a standardized technology could discourage the development of new applications for that technology by allowing SEP owners to appropriate the value created through the investments" of the downstream users of a component. [13]

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[12] Fair Standards Alliance, *Application-Dependent SEP Licensing* 2 (Aug. 30, 2016), https://fair-standards.org/wp-content/uploads/2016/09/FSA-Application-Dependent-Licensing-Paper.pdf.

[13] Fair Standards Alliance, *Application-Dependent SEP Licensing* 3 (Aug. 30, 2016), https://fair-standards.org/wp-content/uploads/2016/09/FSA-Application-Dependent-Licensing-Paper.pdf.

A model with a different licence and rate for each IoT application would make it impossible to have the distribution system that is an integral part of the component manufacturer's business model. A business model with end-device licensing only, will not scale with the IoT. Finally, a semiconductor company cannot foresee all new end-devices making use of its chips and modules that will be developed by downstream innovators.

Thus, the component manufacturer should not, and indeed cannot, act as a collector of royalties for the SEP owner that will be appropriately compensated by the patent system when licensing at the component level, apart from the other patented and unpatented features included in the end product. It is therefore inappropriate to license the component manufacturer basing the royalty on the end-device.

8. Conclusion

When a SEP owner refuses to grant a licence to component manufacturers, it is a breach of the SEP owner's FRAND commitment. The SEP owner voluntarily made that commitment under the SSO's IPR policy to enable other SEP holders and non-SEP holders to supply products that comply with the standard and therefore desire, and rely on the availability, to be licensed to use the SEPs. Level discrimination in SEP licensing harms competition, hampers compliance with patent law in the supply chain, and it undermines a well-established distribution network of world-wide connectivity supply.

Refusals to license and other forms of level discrimination reduce innovation without fully benefitting anyone in the supply chain:

a) The component manufacturer is unable to provide the components free of third-party rights and may, as a consequence, not offer to indemnify its customers;
b) The customer cannot rely on the component manufacturer to deliver components that include third-party IP rights, and may choose competing technologies or component manufacturers who are willing and economically able to offer indemnification; and
c) The SEP owner does not receive royalties for thousands of products implementing the standard.

Consequently, the standard ecosystem as a whole benefits when SEP licensors comply with their FRAND commitments and licence to all in the supply chain that request a licence.

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NOTE: The positions and statements presented in this paper do not necessarily reflect the detailed individual corporate positions of each member.