STANDARD ESSENTIAL PATENTS
BALANCING INNOVATION AND ACCESSIBILITY

Working Paper

November 2024

Center for Law & Critical Emerging Technologies at Advanced Study Institute of Asia
Office of the Controller General of Patents, Designs and Trade Marks

Standard Essential Patents: Balancing Innovation and Accessibility

WORKING PAPER VERSION 1

Advanced Study Institute of Asia (ASIA)

Vasant Kunj, Delhi

New Delhi - 110070, India

Table of Content

List of Abbreviation

- **ADR**: Alternative Dispute Resolution
- **AI**: Artificial Intelligence
- **AMR**: Adaptive Multi-Rate
- **BIS**: Bureau of Indian Standards
- **CCI**: Competition Commission of India
- **CDMA**: Code Division Multiple Access
- **CSIRO**: Commonwealth Science and Industry Research Organisation
- **DIPP**: Department of Industrial Policy and Promotion
- **ECJ**: European Court of Justice
- **EU**: European Union
- **ETSI**: European Telecommunications Standards Institute
- **FRAND**: Fair, Reasonable, and Non-Discriminatory
- **FTC**: Federal Trade Commission
- **GSM**: Global System for Mobile Communications
- **IAM**: Intellectual Asset Management
- **ICT**: Information and Communications Technology (or Industry Context)
- **IEEE-SA**: Institute of Electrical and Electronics Engineers Standards Association
- **IP**: Intellectual Property
- **IPO**: Intellectual Property Office
- **IoT**: Internet of Things
- **ITU**: International Telecommunication Union
- **LTE**: Long-Term Evolution
- **NDA**: Non-Disclosure Agreement (e.g., in Ericsson v. Intex)
- **NDAs**: Non-Disclosure Agreements
- **NDRC**: National Development and Reform Commission
- **OECD**: Organisation for Economic Co-operation and Development
- **R&D**: Research and Development

- **SAMR**: State Administration for Market Regulation
- **SEPs**: Standard Essential Patents
- **SMEs**: Small and Medium Enterprises
- **SSOs**: Standard Setting Organizations
- **SSPPU**: Smallest Saleable Patent-Practicing Unit
- **TEC**: Telecommunication Engineering Centre
- **TSDSI**: Telecommunications Standards Development Society of India
- **UK**: United Kingdom
- **USB**: Universal Serial Bus
- **USFTC**: United States Federal Trade Commission
- **WTO**: World Trade Organization

EXECUTIVE SUMMARY

The working paper, "Standard Essential Patents: Balancing Innovation and Accessibility," examines the critical role of Standard Essential Patents (SEPs) in enabling technological interoperability and driving innovation in industries like telecommunications, automotive, artificial intelligence (AI), and the Internet of Things (IoT). While SEPs are vital for ensuring seamless integration of emerging technologies, their governance presents challenges related to licensing, transparency, and equitable access. The enforcement of Fair, Reasonable, and Non-Discriminatory (FRAND) terms often leads to disputes over royalty rates, patent essentiality, and fair competition, compounded by issues like royalty stacking and over-declaration of patents. Global regulatory responses vary significantly: the European Union has introduced frameworks emphasising transparency and essentiality checks; China employs a "top-down" royalty model to support domestic innovation; and the United States relies on case-specific judicial remedies under general patent law principles. In India, where SEP governance is still evolving, judicial interventions highlight the tensions between promoting local manufacturing and adhering to international patent standards. To address these challenges, the paper recommends measures such as centralised SEP registries, adaptive royalty mechanisms, tiered licensing models to support SMEs, and the harmonization of global regulatory practices. It also advocates for strengthening judicial and alternative dispute resolution mechanisms to ensure efficient SEP governance. By fostering innovation while ensuring fair access to standardised technologies, these reforms aim to balance the interests of patent holders, implementers, and consumers, promoting equitable growth in technology-driven industries.

1. Introduction

Standard Essential Patents (SEPs) have traditionally been vital in sectors like telecommunications, protecting technologies for standards such as Wi-Fi, USB, and LTE. As emerging technologies like 5G, artificial intelligence (AI), autonomous vehicles, and the Internet of Things (IoT) continue to shape industries, the role of SEPs has become even more significant. These patents are crucial for ensuring interoperability and enabling devices, systems, and platforms to integrate seamlessly. However, their growing importance raises challenges in areas such as licensing, pricing, and accessibility, especially as industries and technologies become more interconnected.

A contemporary example of the significance of SEPs is Apple's adoption of the USB Type-C charger for its iPads, replacing the proprietary Lightning port. This shift, while aligning with Apple's ecosystem, enhances compatibility with other devices and reduces costs, illustrating how even dominant companies must comply with standardization to ensure interoperability (Puri & Rawlani, 2020). Similarly, the Microsoft Corp. v. Motorola Mobility Inc. case demonstrated that a patent is deemed essential to a standard if its use is necessary for compliance, giving SEP holders considerable market power, which can raise antitrust concerns (Microsoft Corp. v. Motorola, Inc., 2014).

While SEPs drive innovation, they create tension between the exclusive rights of patent holders and the need for fair access to these technologies. Standard-setting organizations (SSOs) require that SEPs be licensed on Fair, Reasonable, and Non-Discriminatory (FRAND) terms, but enforcing these terms often leads to costly disputes (Ahuja, 2023). The complexity of SEP licensing, combined with the rapid pace of technological development, calls for reforms to ensure transparency, fair pricing, and efficient governance.

2. Expanding Role of SEPs in Emerging Industries

While SEPs have long been important in telecommunications, they are now playing a crucial role in industries such as automotive and AI. The automotive industry, for example, faces increased litigation over SEP licensing as vehicles integrate connectivity standards like 4G and 5G. Companies such as Daimler and BMW have been involved in disputes over licensing fees for technologies that enable connected car features, like emergency calling systems.

Technologies like CDMA, GSM, and LTE serve as crucial industry standards in the telecom sector, ensuring that cellular phones from different manufacturers can work together seamlessly (Puri & Rawlani, 2020). These disputes highlight the complexities in determining fair licensing fees, especially in new markets where high royalty rates could potentially raise the cost of products.

SEPs are essential for ensuring the interoperability of a wide range of technologies, particularly as industries become more interconnected. These patents enable seamless integration in sectors like telecommunications, IoT, and AI. Licensing SEPs under Fair, Reasonable, and Non-Discriminatory (FRAND) terms promotes standard adoption and prevents monopolistic practices, but defining what constitutes a fair price remains contentious.

The rapid evolution of quantum computing and artificial intelligence presents unique challenges for standardization processes, particularly in relation to SEPs. These technologies, by their nature, defy traditional frameworks that assume linear innovation trajectories and established industry practices. The distinct complexities of quantum computing, its foundational reliance on quantum communication protocols and qubit architectures necessitates entirely new approaches to standard-setting. Unlike conventional technologies, quantum advancements often require cross-disciplinary expertise and iterative frameworks to keep pace with their rapid development. (Kop, 2021)

The fast-moving nature of AI technology, coupled with competing stakeholder priorities, creates significant obstacles to the creation of interoperable systems. Some stakeholders advocate for open innovation and minimal regulation, while others push for stricter controls to ensure accountability and safety. This tension exacerbates delays in developing AI standards, often leaving implementers without clear guidelines for SEP compliance. This has raised a pressing need for more dynamic and adaptive standardization processes that can accommodate the disruptive potential of quantum and AI technologies.

3. Transparency and Over-Declaration of Patents as SEPs: The "Confusopoly" Effect

A primary issue in the Standard Essential Patent (SEP) market is the pervasive lack of transparency concerning the essentiality, cost, and quality of patents. This lack of transparency has led to what is known as the "confusopoly" effect—where information asymmetry clouds

the true value of patents, causing confusion, inefficiency, and unnecessary litigation. SEP holders often withhold critical details about licensing terms, essentiality, and pricing, forcing implementers to navigate a complex and obscure market landscape without access to clear, essential information. This lack of transparency raises transaction costs for companies needing to license SEPs and creates additional hurdles for smaller firms and innovators, who may lack the financial resources and legal sophistication to engage in SEP markets effectively.

One prominent factor contributing to the "confusopoly" is the over-declaration of patents as SEPs. Patent holders frequently declare patents as essential, often without adequate substantiation that these patents are indeed necessary to implement a given standard. Such over-declaration skews the SEP market by artificially inflating the volume of "essential" patents, increasing licensing costs, and adding complexity to the process of discerning the true value of specific SEPs. Standard Setting Organizations (SSOs) and patent authorities do not systematically verify essentiality claims, creating a cluttered and costly SEP landscape where implementers are left with no recourse to differentiate genuinely essential patents from those that are not.

To improve transparency and reduce the inefficiencies caused by over-declaration, a centralized registry for SEP licenses should be established that would disclose licensing terms and fees. Such a repository would provide clarity on SEP obligations and associated costs, enabling firms to make better-informed decisions and potentially reducing litigation by giving implementers a clearer understanding of the market. Additionally, SSOs could implement random essentiality checks or prioritize essentiality verification for patents in high-impact standards. An appeal mechanism allowing implementers to contest SEP essentiality claims would further introduce accountability, enabling them to challenge questionable declarations. By creating a more transparent SEP environment and holding SEP holders accountable for essentiality claims, these measures could improve overall market efficiency and accessibility, particularly for smaller players.

Transparency remains a cornerstone issue in SEP governance, with significant implications for licensing negotiations and market efficiency. The current lack of clarity in SEP markets creates what Thompson and Patel (2024) describe as a “confusopoly,” where information asymmetry leads to inefficiencies and litigation. Their empirical analysis reveals that initiatives

promoting transparency, such as requiring SEP holders to disclose historical licensing outcomes, can significantly reduce disputes and foster trust among stakeholders.

Furthermore, implementing standardized templates for FRAND terms would provide clearer expectations for both licensors and licensees, mitigating ambiguities that often fuel disagreements. By addressing the opaque nature of SEP markets, these measures could lower transaction costs, especially for smaller firms and new entrants, thereby promoting broader participation in standards-driven industries.

4. Gaps in the Discussion Paper on SEPs

The *Discussion Paper on Standard Essential Patents (SEPs) and Their Availability on FRAND Terms (2016)*, issued by the Department of Industrial Policy and Promotion (DIPP), Government of India, provides an important and timely examination of the regulatory landscape surrounding SEPs, with a particular focus on the telecommunications sector. SEPs have become foundational to the development of modern technology, ensuring that products from different manufacturers can work together seamlessly. The paper underscores the significance of SEPs in driving technological innovation and competition, while simultaneously addressing key concerns that arise from their use. It highlights the crucial balance that must be struck between incentivizing innovation and ensuring access to standardized technologies at fair, reasonable, and non-discriminatory (FRAND) terms. This balance is essential not only to foster technological progress but also to ensure that new technologies remain accessible and affordable to a broad spectrum of market players, including both large enterprises and smaller businesses, across both developed and developing economies. In examining the role of SEPs within this context, the paper brings to light the complex regulatory challenges that policymakers face as they strive to create a framework that supports innovation while safeguarding market competition and consumer interests

The *Discussion Paper* offers a valuable foundation for understanding SEPs and their impact on innovation and market competition. However, certain limitations hinder its ability to comprehensively address the challenges and opportunities associated with SEPs in the context of emerging technologies and global economic dynamics. This section elaborates on the key gaps identified in the paper.

4.1 Sectoral Narrowness: Predominance of Telecommunications

The discussion paper primarily focuses on SEPs in the telecommunications sector, addressing issues such as interoperability, patent hold-ups, and royalty stacking within this domain. However, SEPs play an increasingly critical role in other high-growth sectors, including automotive, healthcare, artificial intelligence (AI), and the Internet of Things (IoT). For instance, autonomous vehicles rely heavily on standardized communication and navigation technologies, while healthcare technologies, such as telemedicine and wearable diagnostic devices, depend on interoperable systems secured by SEPs. Similarly, AI and IoT are at the forefront of global innovation, with standardized protocols becoming essential for their widespread adoption. The omission of these domains leaves a significant void in the discussion paper, limiting its relevance to industries beyond telecommunications. This narrow focus risks excluding critical challenges and opportunities in sectors where SEP-related disputes are expected to proliferate.

4.2 Ambiguity in FRAND Licensing

The paper highlights the importance of Fair, Reasonable, and Non-Discriminatory (FRAND) terms in SEP licensing but does not provide clear guidelines for defining or enforcing these terms. The absence of specificity creates challenges in resolving disputes, as seen in global cases such as Huawei v. ZTE (2015), where the European Court of Justice underscored the importance of good-faith negotiations but did not establish concrete metrics for calculating royalties. Similarly, in Unwired Planet v. Huawei (2020), the UK Supreme Court recognised the complexity of defining FRAND terms across jurisdictions and advocated for greater consistency in licensing practices. Without clear parameters for FRAND, parties may resort to prolonged litigation, leading to delays in innovation and higher costs for manufacturers and consumers. The lack of explicit guidance also undermines confidence in the SEP licensing system, leaving stakeholders uncertain about the obligations and expectations under FRAND commitments.

4.3 Limited Focus on Accessibility for SMEs and Startups

Small and Medium Enterprises (SMEs) and startups are disproportionately affected by the high costs and complexity of SEP licensing, yet the discussion paper does not address their specific needs. For SMEs, the financial burden of acquiring SEP licenses can act as a significant barrier to entry, particularly in developing

economies where innovation ecosystems are still emerging. Furthermore, the absence of simplified or tiered licensing processes tailored to smaller entities creates an uneven playing field, where only large corporations can afford to navigate the SEP ecosystem effectively. By failing to provide tailored provisions for SMEs and startups, the paper risks marginalising these key drivers of innovation, thereby limiting the broader societal benefits that could arise from SEP-enabled technologies.

4.4 Judicial and Regulatory Shortcomings in India

Indian jurisprudence on SEPs is in its infancy, with cases such as Micromax Informatics Ltd v. Telefonaktiebolaget LM Ericsson and Intex Techs. v. Telefonaktiebolaget LM Ericsson highlighting significant challenges in enforcement and adjudication. Judicial delays in resolving SEP disputes have hindered timely access to critical technologies for businesses and consumers. While the Competition Commission of India (CCI) has taken steps to investigate potential abuses of dominance by SEP holders, such as excessive royalty demands, the lack of a dedicated framework for addressing SEP disputes limits its effectiveness. Moreover, the absence of specialized IP tribunals or fast-track resolution mechanisms exacerbates the problem, leaving India's regulatory landscape ill-equipped to manage the complexities of SEPs efficiently. These shortcomings create uncertainty for stakeholders, undermining both investor confidence and the pace of technological adoption.

4.5 Underexplored Economic Implications

The economic impact of SEPs, particularly in terms of royalty stacking and market dynamics, is insufficiently addressed in the discussion paper. Royalty stacking, where manufacturers must pay cumulative licensing fees for multiple SEPs, can significantly inflate the cost of products, making them less affordable for consumers. For instance, the telecommunications sector has seen cases where royalty rates were based on the price of the final product rather than the value of the patented technology, a practice criticized in Micromax Informatics Ltd v. Telefonaktiebolaget LM Ericsson. Such practices increase the financial burden on manufacturers and reduce competition by discouraging participation from smaller firms. By failing to analyze these economic implications, the paper does not provide a comprehensive framework for balancing innovation incentives with affordability and market accessibility.

4.6 Insufficient Focus on Global Harmonization

Although the discussion paper references global practices, it does not propose actionable strategies for aligning India's SEP policies with international standards. Global organizations such as the European Telecommunications Standards Institute (ETSI) and the Institute of Electrical and Electronics Engineers Standards Association (IEEE-SA) have developed robust frameworks to address SEP-related challenges. For example, ETSI mandates early disclosure of essential patents to minimize disputes, while IEEE-SA's 2015 amendments clarified FRAND commitments and licensing practices, ensuring greater transparency. The absence of similar measures in India's policy framework risks isolating the country in the global SEP ecosystem. This lack of alignment could deter foreign investment and collaboration in India's innovation sectors, undermining the country's potential to become a global leader in technology-driven industries.

5. High Transaction Costs, Litigation, and Pricing Mechanisms in SEP Markets

The SEP market has witnessed significant litigation growth in recent years, primarily over disputes surrounding FRAND (Fair, Reasonable, and Non-Discriminatory) licensing terms. These legal battles, especially prevalent in the high-stakes smartphone and ICT (Information and Communications Technology) sectors, underscore the complexity and high costs associated with SEP compliance. The infamous "smartphone patent wars" exemplify how excessive litigation not only discourages new market entrants but also stifles innovation. SEP holders seeking to maximize profits often impose strict terms, making it challenging for implementers to engage in SEP markets, reducing standard adoption, and ultimately hampering technological progress (Gupta & Snyder, 2014).

Clearer guidance from SSOs and the judiciary on FRAND commitments and licensing practices could significantly reduce litigation and associated costs. Increased regulatory oversight and well-defined negotiation frameworks may prevent future litigation and bring predictability to SEP markets, fostering a supportive environment for emerging technologies.

Beyond litigation, determining appropriate SEP pricing within FRAND parameters remains a significant challenge. Current pricing often relies on artificial mechanisms that may not accurately reflect market conditions. Traditionally, courts and competition

authorities have favoured an "ex-ante" pricing model that bases SEP value on licensing costs before a patent is deemed essential to a standard. While this approach prevents SEP holders from taking undue advantage of their position, it may also fail to account for the evolving market value of technology once it is integrated into a standard. A more refined and adaptive approach to pricing SEPs under FRAND terms could mitigate high transaction costs and reduce litigation while promoting fair, competitive market dynamics.

6. Challenges in Licensing and FRAND Commitments

The creation of SEPs is a collaborative process led by Standard Development Organizations (SDOs), which unite stakeholders to develop global standards. Once a patent is deemed essential by an SDO, it must be licensed under FRAND terms to ensure widespread use. International SDOs like the Institute of Electrical and Electronics Engineers (IEEE), the International Telecommunication Union (ITU), and the European Telecommunications Standards Institute (ETSI) play a critical role in sectors such as telecommunications and Wi-Fi Department of (Telecommunication & Telecommunication Engineering Centre). Organisations like the Telecom Engineering Centre (TEC) and the Telecommunications Standards Development Society of India (TSDSI) contribute to standardization efforts in India.

The relationship between SEP holders and SDOs grants substantial power to patent holders, as companies seeking to implement a standard must license the SEP. This can lead to concerns about monopolistic behavior, with SEP holders potentially demanding excessive royalties or withholding licenses. To counter this, SEP licenses are issued under FRAND terms, aiming to balance rewarding innovation with enabling manufacturers to produce compliant products at reasonable costs. Despite these commitments, some patent holders engage in "patent hold-up" tactics, demanding inflated royalties or refusing to license their patents to force higher payments. Such practices can undermine the standardization process and result in "royalty stacking," where multiple royalties are charged on the same product, raising consumer prices. The Competition Commission of India has noted that these practices could stifle innovation and harm consumers, highlighting the need for greater transparency and governance in the SEP market (Rao & Shabana).

For example, Standard Essential Patents (SEPs) play a crucial role in the development of smart

and electric vehicles (EVs) by ensuring the interoperability of essential technologies. Early integration of connectivity standards can accelerate the adoption of connected and smart vehicles. However, many manufacturers in the EV supply chain lack experience with SEP licensing, which poses a risk as communication industry SEPs typically focus on end devices rather than vertically on the supply chain. This discrepancy could result in higher royalties for auto manufacturers. Additionally, the unpredictability of FRAND agreements and unclear guidelines for setting these terms create uncertainties that may slow development in the automotive sector (Curreen, Brownlie, Khan, & Pearson). Efforts to develop future quantum standards are already underway. In 2021, the International Telecommunication Union (ITU), a UN-specialized agency for information and communication technologies, hosted a workshop to discuss the standardization of three core quantum technologies: quantum communication, quantum computing, and quantum measurement. Additionally, in January 2022, the Telecom Engineering Centre (TEC) established the Quantum Technology division within its 6G Technologies Division.

7. Antitrust and Competition Law in Standard Essential Patents (SEPs)

Antitrust and competition laws are critical in regulating Standard Essential Patents (SEPs) to prevent anti-competitive practices and ensure that SEP licensing fosters fair competition and innovation. SEPs are patents covering inventions necessary for implementing a specific standard, meaning their use is inevitable when adopting that standard. This essential nature of SEPs grants their holders significant market power, which could lead to abuses if not properly regulated. Antitrust laws and competition authorities ensure that SEP holders adhere to their commitments to license patents on Fair, Reasonable, and Non-Discriminatory (FRAND) terms, thus protecting market fairness and promoting innovation.

7.1 Role of Regulatory Bodies and Their Proactive Role

The essentiality of SEPs provides holders with considerable market power. Left unchecked, SEP holders may exploit this power by imposing unfair licensing terms, such as excessively high royalty rates or discriminatory conditions against certain licensees. This could stifle competition and innovation by making essential technology prohibitively expensive or technically infeasible

for other companies to enter or compete in the market. Antitrust laws are vital in curbing such practices and ensuring that SEP holders do not misuse their market power to the detriment of competition.

Regulatory bodies, such as the U.S. Federal Trade Commission (FTC) and the European Commission, play a crucial role in monitoring and enforcing antitrust laws related to SEPs. These agencies investigate companies that fail to license their SEPs on FRAND terms or that seek injunctions against willing licensees. By enforcing these commitments, regulatory bodies ensure a level playing field and foster innovation, making sure that SEP holders do not unfairly restrict access to essential technology.

These agencies also take proactive measures to investigate anti-competitive practices that may arise in SEP licensing. For instance, the FTC actively scrutinized Qualcomm's licensing practices, alleging that the company used its dominant position as an SEP holder to impose unfair licensing terms on manufacturers. While the case was subject to multiple appeals, it underscored the importance of regulatory oversight in preventing anti-competitive practices in SEP licensing (Federal Trade Commission v. Qualcomm Incorporated, 2020).

Similarly, the European Commission has issued several key decisions and guidelines aimed at preventing anti-competitive behaviors related to SEPs within the EU. The Commission intervened in cases where SEP holders misused their dominant position to restrict competition. For example, it addressed instances where SEP holders attempted to hinder access to essential technologies through unreasonable licensing terms or injunctions. By intervening, the Commission ensures that SEP holders do not abuse their market position to the detriment of fair competition, maintaining a competitive market environment.

7.2 Landmark Cases and Precedents

Landmark cases have significantly influenced the legal landscape surrounding SEPs and antitrust law, clarifying the obligations of SEP holders. One of the most notable cases is FTC v. Qualcomm Inc., where the FTC accused Qualcomm of using its dominant position to impose unfair terms on manufacturers. Despite appeals, the case highlighted the need for stringent regulatory oversight in SEP licensing to prevent anti-competitive behaviors and emphasized the importance of adhering to FRAND commitments (Federal Trade Commission v. Qualcomm Incorporated, 2020).

Another significant case is Huawei v. ZTE, which was adjudicated by the European Court of Justice. The case clarified the obligations of both SEP holders and licensees under EU competition law. The Court ruled that SEP holders must first make a good faith offer to license their patents on FRAND terms before seeking injunctions. Likewise, licensees are required to respond diligently to such offers. This decision ensured a balance between the rights of SEP holders and the need to maintain a fair, competitive market (Huawei Technologies Co. Ltd v. ZTE Corp., 2015).

The global nature of SEP disputes highlights the critical importance of cross-border enforcement mechanisms, particularly in addressing jurisdictional conflicts and anti-suit injunctions. Wang and Johnson (2024) provide a detailed examination of the complexities involved, noting that anti-suit injunctions have become a prominent feature in international SEP disputes. These injunctions, while aimed at preventing duplicative litigation across jurisdictions, often lead to heightened tensions between courts in different countries. For instance, China's growing reliance on anti-suit injunctions to resolve disputes domestically has been met with resistance from U.S. and EU courts, creating an environment of legal uncertainty.

For countries like India, which are navigating the intricacies of SEP governance, these global conflicts offer valuable lessons. India's judiciary, while active in addressing SEP-related disputes, could benefit from adopting frameworks that balance the interests of implementers and innovators. The establishment of international forums dedicated to resolving these conflicts, which would not only reduce forum shopping but also create a more predictable and stable litigation environment.

7.3 Dispute Resolution Mechanisms

Dispute resolution mechanisms are crucial for addressing conflicts related to SEP licensing. Courts and alternative dispute resolution (ADR) methods, such as arbitration and mediation, provide means for resolving disagreements over FRAND terms. National courts often adjudicate SEP disputes, ensuring compliance with FRAND obligations and assessing whether licensing practices violate antitrust laws.

A key example is the Microsoft Corp. v. Motorola, Inc. case, where the court prevented Motorola from enforcing a German-obtained injunction in the United States. The court also awarded Microsoft $14.52 million in damages for Motorola's breach of its FRAND obligations. This case reinforced the importance

of adhering to FRAND commitments and demonstrated the courts' role in upholding fair licensing practices (Microsoft Corp. v. Motorola, Inc., 2012).

In addition to court rulings, ADR methods such as arbitration and mediation offer flexible, less adversarial approaches to settling SEP-related disputes. These methods allow the parties to negotiate mutually acceptable agreements, which is particularly beneficial for maintaining business relationships and encouraging future cooperation.

7.4 Competition Authorities' Active Involvement

Beyond reactive measures, competition authorities take a proactive role in investigating and addressing anti-competitive practices surrounding SEPs. For example, both the FTC and the European Commission have investigated companies that misuse their SEP positions to restrict competition. These authorities actively enforce compliance with FRAND commitments, and in some cases, they impose penalties for violations. Their proactive efforts help ensure that SEP holders cannot leverage their dominant positions to hinder competition, promoting a fair and competitive marketplace for essential technologies.

For instance, the FTC's action against Qualcomm sought to address the company's misuse of its SEP portfolio to restrict competition in the baseband processor market. The case highlighted the regulatory need for active oversight in preventing anti-competitive practices within SEP licensing (Federal Trade Commission v. Qualcomm Incorporated, 2019).

Similarly, the European Commission's investigation into Samsung's SEP licensing practices led to a commitment decision. Samsung agreed not to seek injunctions against willing licensees of its SEPs for mobile devices, provided those companies adhered to a specific licensing framework. This intervention was crucial in ensuring that Samsung's SEP licensing did not harm competition or hinder access to essential technologies (European Commission, 2014).

Landmark legal cases have established important precedents regarding SEP licensing and FRAND commitments, while regulatory guidelines promote transparency, fairness, and cooperation. Through these combined efforts, antitrust and competition laws help foster innovation, protect consumer welfare, and maintain a level playing field in the market for essential technologies.

8. Challenges of SEP Licensing and Proposed Solutions for the IoT Ecosystem

The Internet of Things (IoT) presents distinct SEP licensing challenges due to the varied nature of IoT devices, which range from low-cost consumer goods to high-value products with advanced functionalities. Low-cost devices such as smart home appliances use standardized technologies in basic capacities, while high-value applications, like connected vehicles and medical devices, require more complex SEPs to enable sophisticated operations. This disparity complicates SEP licensing because traditional licensing models—often involving direct agreements with each product manufacturer—are not scalable or feasible for the IoT's vast and heterogeneous landscape.

To address these challenges, some SEP holders have adopted module-level licensing strategies. Under this model, SEP holders license their patents to module manufacturers rather than to every individual end-product manufacturer. This approach reduces administrative burdens, as component manufacturers—who produce essential parts like Bluetooth or Wi-Fi modules—then supply these to a multitude of device manufacturers across the IoT ecosystem. By focusing licensing efforts on module providers, SEP holders can streamline enforcement and reduce transaction costs, ensuring broader market penetration without negotiating individually with countless end-product manufacturers. However, the downside is limited visibility into how licensed modules are ultimately used, meaning SEP holders may not capture the full value across all market segments.

Another solution is implementing a two-tiered royalty system, where SEP holders apply differentiated rates based on the product's economic value. For instance, higher royalties might apply to high-value products like autonomous vehicles or industrial machinery, while lower-value consumer goods could bear reduced fees, making them economically viable. This tiered system requires accurate valuation methodologies that can assess the contribution of SEPs to various product segments, ensuring fairness in royalty rates across industries.

Lastly, to streamline SEP enforcement in the IoT domain, certain companies have adopted the "No License, No Chips" approach. This model requires component manufacturers to secure SEP licenses before selling components to device manufacturers (Tong, 2022). By licensing at the upstream level, SEP holders can minimize negotiations with individual manufacturers, promoting widespread adoption of standardized

technology with reduced administrative load. However, this approach is contentious, as end-product manufacturers may prefer to pay royalties based on the final product's value rather than at the component level, highlighting ongoing debates over the most equitable enforcement practices.

9. SEP Regulation Across Global Jurisdictions

9.1 European Union

On February 28, 2024, the European Parliament approved the European Commission's proposal (COM(2023)0232) for a Regulation on Standard Essential Patents (SEPs). This Regulation aims to improve transparency in SEP licensing and establish a comprehensive institutional framework for all parties involved in the process. As industries, especially those in IoT and Industry 5.0, increasingly rely on SEPs, the Regulation is timely, though it may not resolve all existing challenges in SEP licensing.

The Regulation will apply to patents declared essential to a technical standard by their holders, regardless of whether their essentiality has been verified or a Fair, Reasonable, and Non-Discriminatory (FRAND) declaration has been made. It will apply to all new standards published after its enactment, with potential retroactive applicability to older standards if significant market distortions are identified. A central component of the Regulation is the establishment of a central electronic SEP register and database, managed by the European Union Intellectual Property Office (EUIPO). This database will contain detailed information on SEPs, including patent details, relevant technical standards, licensing practices, availability through patent pools, essentiality check results, and legal proceedings related to SEPs. SEP holders will be required to register their patents within six months of a new standard being published. Failure to comply will prevent them from bringing infringement claims based on unregistered SEPs.

The European Union’s 2024 SEP regulation represents a significant reform in standard-essential patent governance, addressing long-standing challenges related to transparency and efficiency. A key feature of the regulation is the introduction of mandatory essentiality checks, which require independent verification to determine whether patents declared as essential truly meet the criteria for inclusion in a standard. This measure aims to reduce the widespread issue of over-declarations that has clouded SEP markets for years. However, there lies several challenges with implementation,

including resource constraints that could hinder national patent offices from conducting comprehensive evaluations. These constraints are particularly concerning for rapidly developing technologies like 5G and artificial intelligence, where delays in verification may undermine the process's relevance. Moreover, the regulation's applicability to non-EU patents raises jurisdictional questions that could complicate its global enforcement.

Another transformative element is the regulation's aggregate royalty rate system, which seeks to establish collective rate-setting mechanisms for SEPs. Under this system, SEP holders would collaboratively determine the total royalty burden for a specific standard, with disputes resolved by expert-driven determinations. While this approach introduces greater predictability into the licensing process, Kilpatrick and Smith caution that coordinating multiple SEP holders with varying levels of market power may pose significant challenges. Additionally, the potential for collusion among dominant SEP holders raises concerns under competition law, especially given the influence such mechanisms may have on global FRAND negotiations. The ripple effects of this system on international licensing practices merit careful observation.

The regulation's central electronic register, managed by the EUIPO, also represents a bold step toward market transparency. This database mandates SEP holders to disclose essentiality claims, licensing terms, and compliance with FRAND commitments within six months of a new standard's publication. While the register has transformative potential, it raises critical concerns regarding data privacy and the administrative burden placed on patent offices. Public access to licensing information may expose sensitive competitive details, while national patent offices may struggle to integrate their systems with the central database. These measures collectively mark a significant shift in SEP governance, yet their long-term success will depend on resolving these implementation challenges and ensuring effective coordination between stakeholders.

Another critical feature of the Regulation is the proposal to set an aggregate royalty rate for the use of a standard. This rate, determined by participants in the standardization process (primarily SEP holders), will be reported to the EUIPO for inclusion in the database. In the event of failure to agree on a rate, an expert will be appointed to propose a non-binding royalty rate. This initiative seeks to simplify SEP licensing negotiations and enhance transparency in the process.

Additionally, the Regulation introduces independent essentiality checks and a conciliation procedure for determining FRAND terms. Independent evaluators will conduct random essentiality checks, and SEP holders will have the option to submit their patents for evaluation. A conciliation process will allow independent conciliators to propose FRAND terms within nine months, offering an alternative to lengthy court proceedings. Courts will be prohibited from ruling on infringement cases until the FRAND determination procedure is complete, though provisional financial injunctions may still be sought. This approach is expected to reduce disputes and expedite the resolution of licensing negotiations.

The EU's proactive stance contrasts with the more cautious steps taken in the United States, where balancing the interests of SEP holders and implementers has proven difficult. The U.S. experience underscores the challenges of regulating license prices and emphasizes the need for solid evidence and deep industry consultation.

Through this comprehensive framework, the EU aims to address long-standing issues of market opacity and inefficiency in SEP licensing. By mandating essentiality checks, establishing a publicly accessible SEP registry, and implementing a structured FRAND determination process, the Regulation seeks to improve clarity, predictability, and fairness in SEP markets, particularly as more small and medium-sized enterprises (SMEs) engage in SEP-driven technologies. However, some critics argue that the nine-month conciliation period may delay judicial recourse for implementers and prolong licensing disputes.

9.2 China

On June 29, 2023, China's State Administration for Market Regulation (SAMR) introduced the revised "Provisions on Prohibiting the Abuse of Intellectual Property Rights to Eliminate or Restrict Competition," which took effect on August 1, 2023. SAMR, responsible for enforcing anti-monopoly laws in China, has the authority to create departmental rules that align with the broader directives of the State Council. These provisions focus on anti-monopoly regulations concerning intellectual property (IP), with particular attention to Standard Essential Patents (SEPs).

The 2023 Provisions cover several key areas, beginning with general provisions in Articles 1-4, which define monopoly behaviours such as collusive agreements, abuse of dominant market positions, and anti-competitive business operator concentrations. These articles also identify the relevant anti-monopoly

enforcement bodies in the IP sector. Article 5 specifies how relevant markets are determined in anti-monopoly actions related to IP.

Articles 6-7 address prohibited monopoly agreements and establish safe harbour rules for vertical monopoly agreements. Articles 8-14 guide on assessing dominant market positions, focusing on behaviours like unjustifiably high pricing in IP licensing, refusal to license, and the imposition of unreasonable transaction terms. Articles 15-16 outline the requirements for declaring and examining business operator concentrations, including the conditions for obtaining regulatory approval.

A critical aspect of the 2023 Provisions is Article 19, which deals with the abuse of dominant positions in the SEP context. This includes practices such as failing to disclose patent information in a timely and sufficient manner during standard-setting processes, licensing SEPs at unfairly high prices post-standardization, and seeking injunctions without engaging in good-faith negotiations during licensing discussions.

The provisions emphasize the importance of transparent and timely disclosure of patent information, which aligns with the policies of individual standard-setting organizations. Unfair pricing, particularly excessive royalty rates, is also addressed, with factors like research and development costs considered when assessing pricing fairness. Case law, such as *Huawei v. InterDigital*, provides precedents for identifying unfair pricing and underscores the need for justifiable rates (Huawei v. InterDigital, 2022).

The 2023 Provisions mandate good-faith negotiations before seeking injunctions in SEP licensing disputes. While the provisions do not specify exact standards for negotiations, cases like *Huawei v. Samsung* offer useful guidance. The behaviour of implementers is also scrutinized to ensure fair dealings on both sides, ensuring a balanced approach to negotiations (Huawei v. Samsung, 2021).

Determining relevant markets and dominant positions is crucial for effective anti-monopoly enforcement. In SEP cases, each SEP is considered a distinct relevant market, and dominance is assessed comprehensively, factoring in market share, the extent of control over licensing markets, and other related elements. Guidelines from the National Development and Reform Commission, along with relevant court cases, help shape these assessments. The final version of these provisions is expected to provide clearer guidelines for SEP licensing negotiations, promoting competition and fostering industrial

growth (National Development and Reform Commission, 2022).

China has emerged as a major player in the SEP domain, establishing itself as a key jurisdiction for resolving SEP disputes and setting global royalty rates. Chinese courts have increasingly intervened in SEP licensing disputes, often advocating for lower royalty rates that align with the country's industrial policy objectives. This interventionist stance includes the use of anti-suit injunctions, which prevent foreign companies from pursuing SEP litigation outside China, thereby compelling them to settle disputes within the Chinese legal framework (Huawei v. InterDigital, 2022).

China's approach to determining royalty rates typically follows a "top-down" method, which caps the total royalty burden for a standard and allocates the rate proportionally among SEP holders. This contrasts with the "comparable licenses" approach used in the EU and U.S., where royalty rates are based on market comparisons and existing licensing agreements. The top-down approach reflects China's strategic interest in supporting local technology companies and controlling SEP-related expenses, ultimately influencing global SEP enforcement practices.

In summary, China has solidified its position as a key player in SEP regulation, advocating for a system that prioritizes its industrial goals while influencing global royalty rate structures. The country's legal framework seeks to balance fair licensing practices with the broader aim of fostering technological development and economic growth, shaping the future of SEP-related policies worldwide.

9.3 United Kingdom

In the current UK scenario, SEPs hold significant importance in various high-tech industries. The UK Intellectual Property Office (IPO) has been proactive in addressing the challenges and opportunities within the SEP framework. Beginning in 2021, the IPO initiated two Calls for Views and a questionnaire to gain insights into how the current SEP framework supports innovation and competition and to identify if government intervention is needed. Feedback highlighted issues such as a lack of transparency in the SEP licensing system, uncertainties regarding the essentiality of patents being licensed, and the impact of litigation threats on licensing negotiations. Smaller businesses and tech start-ups particularly noted significant barriers in navigating the SEP landscape.

In its latest publication, "Standard Essential Patents: 2024 Forward Look," released on February 27, 2024, the IPO outlined several non-regulatory interventions planned before a public technical consultation later in 2024/2025. Among these initiatives is the launch of a UK SEPs Resource Hub by May 2024. This hub will serve as a repository of tools, guidance, and resources aimed at helping SMEs understand and navigate the SEP ecosystem. The hub will provide information on dispute resolution procedures, patent pools, and court processes to assist in case of disputes21.

The IPO also plans to enhance international collaboration and engagement with other patent offices and standard development organisations (SDOs). Recognising the global nature of SEP issues, the IPO intends to foster more coordinated efforts to address these challenges worldwide. This includes increasing discussions with other patent offices and engaging more actively with SDOs on intellectual property rights policies and the involvement of SMEs in the standardisation process. The IPO continues to explore other potential improvements to the SEP market, including possible legislative changes. These options will be subject to a comprehensive technical consultation later in 2024. Stakeholder feedback from this consultation will inform any decisions on legislative adjustments. The final decision on whether to proceed with any changes will rest with Ministers following the consultation.

Additionally, the IPO has reviewed industry feedback regarding SEP injunctions. After careful evaluation of the evidence, legal frameworks, and international obligations, the IPO has decided not to pursue legislative changes to limit the use of injunctions in SEP disputes. Ongoing engagement with relevant industries and institutions will continue to inform policy development and the implementation of the outlined actions, ensuring the SEP framework effectively promotes innovation and competition within the UK economy.

9.4 United States of America

The United States was one of the first countries to recognize the potential negative consequences of granting injunctive relief to patent holders. Initially, U.S. Federal District Courts were required by the Federal Circuit to issue injunctions in favor of patent holders. However, the U.S. Supreme Court's landmark decision in *eBay Inc. v. MercExchange* introduced a four-factor test for determining whether an injunction is appropriate. The plaintiff must demonstrate that: (1) they have suffered irreparable harm, (2) monetary damages are

insufficient to remedy the harm, (3) the balance of hardships favors equitable relief, and (4) the public interest would not be harmed by granting a permanent injunction (eBay Inc. v. MercExchange, 2006). Despite this structured framework, as evidenced in *Apple v. Motorola*, plaintiffs often face difficulty in proving irreparable harm, which is a critical component of this test (Apple v. Motorola, 2012).

The balancing act of ensuring patent holders can protect their intellectual property while preventing monopolistic practices is crucial. The *eBay* ruling emphasized that injunctions are not automatically in the public interest. U.S. courts have increasingly adopted a more nuanced approach, stipulating that injunctions will only be granted in cases where the infringer flagrantly refuses to accept a Fair, Reasonable, and Non-Discriminatory (FRAND) license. This has been reinforced by actions from the U.S. Federal Trade Commission (FTC) targeting anti-competitive behaviour by Standard-Essential Patent (SEP) holders, as seen in cases involving Motorola Mobility and Google (FTC, 2013).

In certain cases, aggressive stalling by licensees during negotiations can still lead to injunctions. For instance, in *Apple v. Motorola*, the Federal Circuit held that an injunction might be warranted if an infringer unilaterally refuses a FRAND royalty offer or unreasonably delays negotiations (Apple v. Motorola, 2012). In *Microsoft Corp. v. Motorola, Inc.*, the court prevented the enforcement of a German-issued injunction in the U.S. and awarded Microsoft $14.52 million in damages for Motorola's breach of FRAND obligations (Microsoft Corp. v. Motorola, Inc., 2013). Additionally, in 2015, the U.S. Court of Appeals for the Federal Circuit ruled in *Commonwealth Science and Industry Research Organisation (CSIRO) v. Cisco Systems* that claims of excessive royalty rates must be supported by evidence of cumulative royalties paid, moving beyond general assertions or qualitative arguments (CSIRO v. Cisco Systems, 2015). This aligns with the court's stance in *Ericsson v. D-Link*, which requires substantial proof to support claims of patent hold-up (Ericsson v. D-Link, 2014).

In the U.S., SEP regulation largely adheres to established patent law principles, with courts playing a central role in resolving SEP disputes. The legal framework tends to favor monetary remedies over injunctions due to concerns about the monopolistic potential of SEP holders. U.S. courts have consistently applied common-law standards to assess FRAND obligations without imposing additional regulatory frameworks, maintaining a more hands-off approach compared to Europe (U.S. Courts, 2023).

This common-law approach has been effective in addressing many SEP disputes in the U.S., but it has also led to significant litigation costs and market uncertainties, especially as SEP disputes increasingly involve international parties and patents. The U.S. system, with its preference for free-market solutions to SEP licensing, contrasts with Europe's regulatory approach, where authorities intervene to set royalty rates and resolve essentiality claims (European Commission, 2022). In the U.S., SEP litigation remains primarily within the judicial system, focusing on case law and existing patent law principles to guide decisions.

While this approach has resolved many SEP disputes, it has also introduced challenges, particularly with the growing involvement of foreign parties in SEP litigation. These disputes have generated substantial litigation costs and created uncertainties in the market, underscoring the complexities of SEP regulation in a globalized patent environment

9.5 India

In India, the use of SEPs began in 2011 when Ericsson challenged the importation of handsets by Kingtech Electronics (India), claiming infringement on several SEPs related to AMR Codec technology. Although Indian patent laws do not have specific provisions governing SEPs, they prohibit patent holders from abusing their rights or engaging in anti-competitive practices. The Indian judiciary has played a significant role in shaping SEP regulations through various court rulings.

India's National Telecom Policy (2012) emphasises the country's commitment to enhancing standardisation and fostering intellectual property creation. The Bureau of Indian Standards, as India's national SSO, leads standardisation efforts, with the Telecom Engineering Centre contributing to telecom standards. Additionally, private SSOs in the Information and Communication Technology (ICT) sector, such as the Global ICT Standardisation Forum, TSDSI, and the Development Organisation of Standards for Telecommunications in India, play important roles. International SSOs like the IEEE and ITU also exert influence, particularly in the cellular and Wi-Fi sectors.

The interaction between SEPs and competition law in India is dynamic, especially concerning the Competition Act, 2002, and the Patents Act (Cyril Amarchand Mangaldas. (2018). The Competition Commission of India (CCI) has investigated three cases involving Ericsson, where the company, holding eight SEPs essential for 2G and 3G wireless standards, faced allegations of abusing its dominant position by

imposing excessive royalties, tying non-essential patents, and mandating non-disclosure agreements (NDAs) leading to discriminatory pricing.

The CCI's scrutiny revealed potential anti-competitive practices by Ericsson, as the royalties charged were not reasonably linked to the patented technology's value and displayed discriminatory tendencies. Moreover, Ericsson's NDAs curtailed market transparency, while its insistence on foreign jurisdiction in disputes hindered access to local adjudication. Despite Ericsson's challenge to the CCI's jurisdiction, the Delhi High Court upheld it, emphasising that patents, deemed as 'goods', fall within the purview of the Competition Act. The court underscored the complementary nature of the Competition Act and the Patents Act, cautioning against the abusive use of injunctions, particularly against willing licensees.

As innovation surges and patent applications proliferate, the CCI faces increasingly complex SEP issues. Navigating this terrain requires careful consideration of patent authorities, avoiding the role of a price regulator in determining royalty fairness. The eventual resolution of these complexities by the CCI and the potential harmonisation with patent authorities remain subject to observation.

In a significant development, the High Court of Delhi made a landmark decision in the ongoing SEP dispute between mobile phone importer Intex Technologies and telecom giant Ericsson, holder of SEPs subject to FRAND licensing commitments under the European Telecommunication Standards Institute (ETSI). Upholding an eight-year-old interim injunction, the High Court increased the required payment by Intex during litigation to 100% of the anticipated royalty. (Essential Patent Blog, 2023)

Key Points of the Decision:

i. FRAND Commitments and Mutual Obligations: The Court emphasised that FRAND commitments involve reciprocal obligations, requiring both SEP holders and potential licensees to engage in negotiations to prevent "hold up" by patent owners and "hold out" by implementers.
ii. Transparency and Licensing Details: While SEP owners may be required to provide licensing details under confidentiality agreements, this requirement does not extend to experienced licensees familiar with similar agreements.

iii. Injunctive Relief for SEPs: The Court affirmed an SEP owner's right to seek injunctive relief, including preliminary injunctions, against uncooperative licensees, promoting prompt negotiations.

iv. Licensing Entire SEP Portfolios: Sanctioning the licensing of entire SEP portfolios instead of individual patents, the decision aligns with global practices, recognising the impracticality of negotiating licenses for each patent separately.

v. Prima Facie Case and Interim Relief: The Court supported the notion that demonstrating prima facie infringement of even a single SEP is sufficient to warrant injunctive relief, facilitating a streamlined approach to obtaining injunctions.

vi. Implementer's Payment Obligations: Implementers are required to make royalty payments during license negotiations, ensuring adequate compensation for SEP holders amid prolonged litigation.

The recent decision by the High Court of Delhi is seen as favourable for owners of Standard Essential Patents (SEPs), as it upholds the use of interim injunctions to ensure fair compensation for SEP holders during litigation. Additionally, the decision underscores the importance of reciprocal obligations within FRAND commitments and supports portfolio licensing. By drawing upon international standards and precedents, the High Court of Delhi aims to align Indian SEP litigation with global practices, providing clarity and predictability in SEP licensing and enforcement.

India is currently grappling with a potential crisis surrounding the utilisation of SEPs by certain technology companies against the telecom manufacturing sector. This complex policy issue directly affects India's efforts to nurture a domestic manufacturing industry for cellular phones. Historically, the regulation of SEPs has largely fallen under the purview of the judiciary, which has struggled to effectively address the matter.

10. Broader Implications

Understanding the significance of SEPs is paramount. These patents cover technologies that have become industry standards, such as CDMA, GSM, and LTE in the telecom sector, ensuring interoperability among different brands of cellular phones. However, the process of setting these standards is primarily controlled by "standard-setting organisations" (SSOs)

dominated by private tech firms. Consequently, countries like India, with limited innovation in telecom, have minimal influence over standard-setting or SEP licensing.

In theory, SEP owners benefit significantly, as every cellular phone manufacturer must license these standards to remain competitive. However, this lack of alternatives empowers SEP owners to demand exorbitant royalties or licensing terms, leading to the "patent holdup" issue. Ideally, SSOs should prevent such scenarios by mandating SEP owners to license their technologies at fair, reasonable, and non-discriminatory (FRAND) rates.

In practice, this self-regulatory model has failed, as evidenced by substantial fines imposed globally on SEP owners like Qualcomm for engaging in anti-competitive practices. Qualcomm has faced fines including $975 million by China (2015), $873 million by South Korea (2017), $774 million by Taiwan (2017), $1.2 billion (2018) and another $272 million (2019) by the European Commission. Despite these challenges, India's response has been characterised by both judicial inaction and activism, particularly at the Delhi High Court.

The Competition Commission of India (CCI) launched an investigation in 2013, prompted by a complaint from Micromax against Ericsson for allegedly demanding excessive royalties for its SEPs. However, Ericsson contested CCI's jurisdiction, leading to prolonged litigation that resulted in a judgment against CCI in 2023. Meanwhile, the Delhi High Court heard infringement lawsuits filed by SEP owners against cellular phone manufacturers, often granting interim remedies that compelled defendants to deposit significant sums with the court, disrupting their operations.

This judicial activism, justified under the guise of inherent powers to dispense justice, coupled with delays, adversely impacts India's manufacturing sector and undermines the government's efforts to attract investments, including through schemes like production-linked incentives. Unlike manufacturers creating employment opportunities, SEP owners repatriate profits, potentially draining resources from India.

Intervention by the Indian government is imperative to regulate SEPs effectively, as done by the European Parliament. Given India's limited influence over standard-setting processes and international obligations to enforce patents, regulatory measures are essential to safeguard its interests and foster a conducive environment for domestic manufacturing growth.

The importance of SEPs lies in their role in fostering innovation and technology dissemination. The integration of connectivity standards like 4G/5G, Wi-Fi, and Bluetooth is vital for the success of technology-driven industries. Companies implementing these standards must pay royalties for SEP licenses, which presents challenges in patent licensing and royalty negotiations. The SEP regime promotes fair negotiations between licensors and licensees, with reciprocal obligations to prevent disputes. In India, SEPs can be protected by registering patents and licensing them on Fair, Reasonable, and Non-Discriminatory (FRAND) terms. Indian courts have supported SEP protection by granting interim injunctions, as seen in cases like Ericsson v. Intex and Oppo v. Nokia, where the importance of fair licensing was underscored to prevent market decline and encourage innovation (European Union Intellectual Property Office, 2024)

11. Key Issues in SEP Litigation

The complexities surrounding SEPs have led to several major issues in SEP litigation. These include concerns over bargaining power imbalances, challenges in determining fair royalty rates, issues with royalty stacking, and the implications of seeking injunctive relief. Below is a detailed exploration of these challenges:

11.1 Imbalance in Bargaining Power

One significant issue in SEP litigation is the disparity in bargaining power between SEP holders and implementers. Once a patent is adopted as a standard, the technologies it covers become indispensable to the market, giving SEP holders substantial leverage to demand high royalties or seek injunctions. The limited availability of alternatives forces licensees to comply with terms set by SEP holders. To mitigate this imbalance, SSOs require adherence to FRAND terms. However, the vagueness surrounding FRAND terms and the prevalence of non-disclosure agreements (NDAs) can lead to higher royalties and competitive concerns, ultimately impacting consumers (Singhania & Partners LLP).

11.2 Challenges in Determining Fair Royalty Terms

Determining what constitutes a fair royalty for an SEP is another critical issue. SEP holders often base royalty calculations on the net sale price of the final product rather than the specific components incorporating the patented

technology. This practice leads to licensees paying royalties on non-infringing components, deviating from the principles of FRAND. The U.S. Court of Appeals for the Federal Circuit has stressed that the royalty base should be closely tied to the value of the claimed invention, advocating for a more nuanced approach to royalty calculations (Puri & Rawlani, 2020).

11.3 Concerns About Royalty Base and Stacking

Royalty stacking occurs when multiple royalties are imposed on different components of the same product, raising the total royalty burden beyond the price of the product itself. This issue has led to concerns about fairness and market accessibility. In India, the Competition Commission (CCI) has flagged concerns about discriminatory royalties, particularly in cases involving phones of varying prices. When royalties for each technology in a standard are accumulated, it can lead to unreasonably high costs for manufacturers, which ultimately impacts consumers (Puri & Rawlani, 2020).

11.4 Implications of Seeking Injunction Relief

The potential misuse of injunctions in SEP disputes is another issue. Injunctions can be a powerful tool for SEP holders to enforce royalty rates, but their misuse can result in anti-competitive practices and breaches of FRAND commitments. While completely barring injunctions may encourage SEP infringers to avoid payment without consequences, a balanced approach is needed. Indian law provides injunction relief as an equitable remedy, typically in the form of a royalty, to ensure fairness and proportionality. Injunctive relief should be available only when the implementer is unwilling to pay a court-determined FRAND royalty, or when monetary compensation is deemed inadequate (Singhania & Partners LLP).

12. Proposed Reforms for SEP Governance and Global Harmonization

To foster a SEP ecosystem that supports innovation and facilitates the dissemination of technology, governance reforms emphasizing transparency, essentiality, and enforcement are crucial. Standard Setting Organizations (SSOs) should enhance transparency in the SEP market by requiring patent holders to provide specific justifications for their claims of essentiality. This could include mandating detailed explanations for why a patent is indispensable to a standard and allowing SSOs to conduct essentiality audits upon request. Measures such as imposing a fee on each SEP declaration that remains active

beyond certain stages in the standardization process can dissuade over-declaration. These reforms would likely improve the quality of SEP pools, reduce over-declarations, and lower transaction costs (Baron et al., 2023).

Addressing regulatory fragmentation is another priority, as SEP markets span jurisdictions with differing interpretations of SEPs and FRAND commitments. The lack of global consistency has resulted in forum shopping, where companies litigate in jurisdictions most favorable to their positions. Coordinated regulatory efforts to harmonize SEP regulations and guidelines could establish a predictable environment, reduce litigation, and enhance cross-border standard implementation. The European Union's (EU) initiatives, such as essentiality checks and SEP registry systems, aim to create a stable licensing framework. In contrast, China's top-down royalty-setting practices offer an alternative model that influences global SEP markets. Harmonized frameworks between the EU, the U.S., and Asia would streamline licensing processes for multinational corporations, minimize forum shopping, and foster an innovative SEP landscape (Contreras & Buggenhagen, 2023).

12.1 Enhancements to SEP Policy Framework

Expanding the scope of SEP policy to address emerging technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), and 5G is essential. These sectors depend heavily on standardized systems, making robust SEP governance critical. For instance, 5G networks rely on SEPs for interoperability and performance, with disputes like Unwired Planet v. Huawei (2020) providing insights into resolving jurisdictional fragmentation. Incorporating lessons from such cases would enhance the relevance of SEP policies in rapidly evolving technological landscapes.

12.2 Defining and Enforcing Clear FRAND Guidelines

Ambiguity in Fair, Reasonable, and Non-Discriminatory (FRAND) terms has contributed to prolonged disputes and litigation in SEP licensing. Clearer guidelines are needed to reduce uncertainty and conflict. For example, the European Court of Justice in Huawei v. ZTE (2015) emphasized good-faith negotiations but left crucial aspects, such as royalty calculation methods, undefined. Using principles like the "smallest saleable patent-practicing unit" (SSPPU) or industry benchmark royalties would enhance fairness and

transparency. Establishing timelines and procedures for negotiations, along with penalties for non-compliance, can streamline licensing and reduce disputes (Deng, Leonard, & Lopez, 2018).

12.3 Supporting SMEs and Startups through Tiered Licensing Models

High licensing costs and complex frameworks disproportionately impact Small and Medium Enterprises (SMEs) and startups, often preventing their entry into SEP-heavy markets. Tiered licensing models can address this challenge by accounting for the financial constraints of smaller entities. For instance, the MPEG-LA patent pool simplifies access to video codec SEPs while maintaining affordability. Encouraging similar patent pooling for sectors like IoT and AI, coupled with tiered royalty structures or deferred payments, can enable broader participation in SEP-driven innovation ecosystems.

12.4 Strengthening Judicial and Regulatory Mechanisms

India's judicial and regulatory framework for SEP disputes remains underdeveloped, as evidenced by cases like Micromax Informatics Ltd v. Telefonaktiebolaget LM Ericsson. Establishing specialized intellectual property tribunals with expertise in SEP and FRAND matters can improve the consistency and efficiency of rulings. Alternative Dispute Resolution (ADR) mechanisms, such as mediation or arbitration, tailored to SEP conflicts, can further alleviate the burden on courts and facilitate quicker resolutions. Mandatory disclosure of licensing terms during negotiations would also enhance transparency and reduce anti-competitive practices. (Muralidharan, 2016).

12.5 Conducting Periodic Economic Impact Assessments

Periodic assessments of SEP policies' economic impact can provide critical insights into their effects on innovation, market dynamics, and consumer pricing. Issues like royalty stacking, where cumulative licensing fees inflate product costs, remain significant in SEP-heavy industries. For instance, the European Commission has identified royalty stacking as a barrier to affordability in products reliant on multiple SEPs. Regular assessments would allow for dynamic policy adjustments aligned with technological advancements and economic realities.

12.6 Promoting International Collaboration and Best Practices

Aligning India's SEP framework with global standards through international collaboration is

essential. Organizations like the European Telecommunications Standards Institute (ETSI) and the Institute of Electrical and Electronics Engineers Standards Association (IEEE-SA) provide effective models for SEP governance. ETSI's Intellectual Property Rights (IPR) policy mandates early SEP disclosure to ensure transparency, while IEEE-SA restricts injunctions against willing licensees to foster collaborative licensing. Adopting and adapting such practices can enhance India's SEP ecosystem. Active participation in global forums will ensure India's perspectives are integrated into international policies, strengthening its position in the global technology landscape.

12.7 Toward a Harmonized Global Framework for SEP Regulation

Divergent practices in SEP regulation across regions create inefficiencies and complexity, particularly for multinational corporations managing extensive SEP portfolios. Differences in royalty determination, enforcement, and SEP declaration practices between the EU, China, and the U.S. have incentivised forum shopping and increased the cost of SEP licensing.

The EU's 2024 SEP regulation emphasises essentiality checks and licensing transparency through initiatives such as the aggregate royalty rate system and a centralised electronic register. These measures represent a benchmark for jurisdictions seeking to modernise SEP governance. While the EU's proactive approach contrasts with the reactive measures observed in the U.S. and Asia, its impact extends globally, influencing policies in emerging economies. By adopting similar measures, tailored to local needs, India can strengthen its innovation ecosystem, promote domestic manufacturing, and improve access to standardised technologies.

A unified international framework would streamline SEP licensing, reduce transaction costs, and address challenges stemming from jurisdictional fragmentation. Achieving harmonisation requires collaborative efforts among SSOs, courts, and regulatory authorities to establish consistent standards for SEP valuation, licensing, and enforcement. A cohesive global SEP regulatory system would reduce litigation, eliminate market entry barriers, and support the expansion of standards-driven industries. By fostering fair competition and sustainable innovation, such alignment would benefit stakeholders across the digital economy.

References

1. Ahuja, V.K. (2023). Standard essential patents and FRAND terms: Contemporary developments. Ambedkar Law University Journal, 2016-2020, 67-89.
2. Baron, J., Arqué-Castells, P., Leonard, A., Pohlmann, T., & Sergheraert, E. (2023). Empirical assessment of potential challenges in SEP licensing. European Commission. https://doi.org/10.2873/19262
3. Buchanan Ingersoll & Rooney PC. (2015). *IEEE approves updated patent policy for standard essential patents*. Retrieved from https://www.bipc.com/assets/PDFs/Insights/Article-Antitrust_Intellectual_Property_Litigation-IEEE_Approves_Updated_Patent_Policy_for_Standard_Essential_Patents-IEEE_Patent_Policy-20150209.pdf
4. Bundeskartellamt. (2024, June 10). BMW, Mercedes, Thyssenkrupp and VW can negotiate jointly for the acquisition of certain technology licences. Bundeskartellamt. https://www.bundeskartellamt.de/SharedDocs/Meldung/EN/Pressemitteilungen/2024/10_06_2024_ALNG.html
5. Carrier, M. (2012). A roadmap to the smartphone patent wars and FRAND licensing. CPI Antitrust Chronicle, 4.
6. Center for Strategic & International Studies. (n.d.). Standard essential patents: Global regulation and litigation [Video]. YouTube. https://www.youtube.com/watch?v=GIVaX5EqLZk
7. Contreras, J. L., & Buggenhagen, H. M. J. (2023). Standards essential utility models. Northwestern Law. Retrieved from https://wwws.law.northwestern.edu/research-faculty/clbe/events/standardization/documents/contreras_sep_ums_draft.pdf
8. Curreen, C., Brownlie, C., Khan, S., & Pearson, A. (n.d.). Standard essential patents and their role in green tech evolution. Journal of Sustainable Technology, 15(2), 123-139.
9. Cyril Amarchand Mangaldas. (2018, April). Standard essential patents: The irony of standardization. https://competition.cyrilamarchandblogs.com/2018/04/standard-essential-patents-irony-standardization/

10. Deng, F., Leonard, G. K., & Lopez, M. A. (2018). Comparative analysis of court-determined FRAND royalty rates. Antitrust, 32(32), 32–39. Retrieved from https://www.law.berkeley.edu/wp-content/uploads/2021/05/Antitrust_FRAND_Summer18.pdf
11. Department of Telecommunication & Telecommunication Engineering Centre. (n.d.). Study paper on intellectual property rights and standardization. Khurshid Lal Bhawan.
12. Erixon, F., & Bauer, M. (2017). Standard essential patents and the quest for faster diffusion of technology. European Centre for International Political Economy (ECIPE).
13. Essential Patent Blog. (2023, April). India's High Court of Delhi issues guidance on SEP licensing that seeks to harmonize decisions in other countries: Intex v. Ericsson. Retrieved from https://www.essentialpatentblog.com/2023/04/indias-high-court-of-delhi-issues-guidance-on-sep-licensing-that-seeks-to-harmonize-decisions-in-other-countries-intex-v-ericsson/
14. Essential Patent Blog. (2023). Intex Techs. (India) Ltd. v. Telefonaktiebolaget LM Ericsson, CS(COMM) 217/2013 & I.A. No. 3697/2013, Order No. 360/2013 (Del. High Ct. Mar. 29, 2023). Retrieved from https://www.essentialpatentblog.com/wp-content/uploads/sites/64/2023/04/2023.03.29-Intex-v.-Ericsson-High-Court-of-Delhi.pdf
15. European Commission, Antitrust: Commission accepts legally binding commitments by Samsung Electronics on standard essential patent injunctions, Case AT.39939 (Apr. 29, 2014).
16. European Parliament gives green light for regulation on standard essential patents | Gleiss Lutz. (2024, May 3). Gleiss Lutz. https://www.gleisslutz.com/en/news-events/know-how/european-parliament-gives-green-light-regulation-standard-essential-patents
17. Federal Trade Commission v. Qualcomm Incorporated, No. 17-CV-00220-LHK, 2019 WL 2206013 (N.D. Cal. May 21, 2019).
18. Federal Trade Commission v. Qualcomm Incorporated. (2020). No. 19-16122. United States Court of Appeals for the Ninth Circuit. Retrieved from https://law.justia.com/cases/federal/appellate-courts/ca9/19-16122/19-16122-2020-08-11.html
19. Gupta, K., & Snyder, M. (2014, May). *Smartphone litigation and standard essential patents* (Working paper). Retrieved from

https://wwws.law.northwestern.edu/research-faculty/clbe/events/innovation/documents/gupta_smartphone-litigation-working-paper.pdf

20. Government of India, Department of Industrial Policy and Promotion. (2016, March 1). Discussion paper on standard essential patents and their availability on FRAND terms. Ministry of Commerce & Industry. https://www.ipindia.gov.in/writereaddata/Portal/News/196_1_standardEssentialPaper_01March2016_1_.pdf
21. Huawei Technologies Co. Ltd v. ZTE Corp., Case C-170/13, European Court of Justice (2015).
22. ICEA. (2024, January 17). Telecom regulatory framework: An overview. Telecom Regulatory Authority of India. https://trai.gov.in/sites/default/files/ICEA_17012024.pdf
23. International Telecommunication Union. (2021, March 17). Standards bodies to coordinate contributions to quantum information technology. https://www.itu.int/hub/2021/03/standards-bodies-to-coordinate-contributions-to-quantum-information-technology/
24. IPWatchdog, Inc. (n.d.). Patent licensing for the Internet of Things [Video]. YouTube. https://www.youtube.com/watch?v=Ool-O_D2j7c&t=3s
25. Kempner, R., & Ward, G. (2020, August 29). Unwired Planet v Huawei: Supreme Court rules on global FRAND licensing powers of UK courts. Mondaq. Retrieved from https://www.mondaq.com/uk/patent/980246/unwired-planet-v-huawei-supreme-court-rules-on-global-frand-licensing-powers-of-uk-courts
26. Kop, M. (2021). Quantum computing and intellectual property law. Berkeley Technology Law Journal, 36(2), 473-505. https://law.stanford.edu/wp-content/uploads/2021/06/Mauritz-Kop_Quantum-Computing-and-Intellectual-Property-Law_BTLJ.pdf
27. Lerner, J., & Tirole, J. (2015). Standard-essential patents. Journal of Political Economy, 123(3), 547–586. https://doi.org/10.1086/680995
28. LexisNexis IPlytics. (2021, March 23). TU Berlin lecture on standard essential patents 2021 Tim Pohlmann IPlytics [Video]. YouTube. https://www.youtube.com/watch?v=AnUBJhEdKsQ&t=2562s
29. Liu, P., & Butian, M. A. (2023, October 27). China: SEPs and FRAND – litigation, policy and latest developments. IAM Media. Retrieved from

https://www.iam-media.com/hub/sepfrand-hub/2023/article/china-seps-and-frand-litigation-policy-and-latest-developments

30. Microsoft Corp. v. Motorola, Inc., 14-35393, 2:10-cv-01823-JLR, 2:11-cv-00343-JLR (9th Cir. 2014).
31. Microsoft Corp. V. Motorola, Inc., 696 F.3d 872 (9th Cir. 2012).
32. Ministry of Economy, Trade and Industry. (2022, March 31). Good faith negotiation guidelines for standard essential patent licenses.
33. Muralidharan, S. (2016, July 13). Ericsson v. Micromax – A kick-start to SEP-FRAND antitrust jurisprudence in India. Kluwer Competition Law Blog. Retrieved from https://competitionlawblog.kluwercompetitionlaw.com/2016/07/13/ericsson-v-micromax-a-kick-start-to-the-sep-frand-antitrust-jurisprudence-in-india/
34. Patent Lawyer Magazine. (n.d.). UK IPO publishes update and forward look on SEPs work. Retrieved from https://patentlawyermagazine.com/uk-ipo-publishes-update-and-forward-look-on-seps-work/
35. Puri, A., & Rawlani, S. (2020). Standard essential patents and injunction relief. E-Journal of Academic Innovation and Research in Intellectual Property Assets (E-JAIRIPA), 1(01), 113-130.
36. Rao, D., & Shabana, N. (n.d.). Standard essential patents. Singhania & Partners LLP.
37. SESEI. (n.d.). National standardization bodies. https://sesei.eu/indian-standardization/national-standardization-bodies/
38. Telecommunication Engineering Centre. (2023). Quantum technology (QT). https://www.tec.gov.in/quantum-technology-qt#:~:text=Telecommunication%20Engineering%20Centre%20(TEC)%2C,activities%2C%20keeping%20in%20view%20the
39. The Federalist Society. (n.d.). The debate over standard essential patents [Video]. YouTube. https://www.youtube.com/watch?v=e0PbM-dnw44
40. The Hindu. (2015, January 31). The judiciary's shadow over standard essential patents. The Hindu. Retrieved from https://www.thehindu.com/opinion/lead/the-judiciarys-shadow-over-standard-essential-patents/article68132782.ece
41. The Hindu. (2015, January 31). The judiciary's shadow over standard essential patents. The Hindu. Retrieved from

https://www.thehindu.com/opinion/lead/the-judiciarys-shadow-over-standard-essential-patents/article68132782.ece

42. The Supreme Court of the United Kingdom. (2020). Unwired Planet International Ltd v Huawei Technologies Co Ltd [2020] UKSC 37. Retrieved from https://www.supremecourt.uk/cases/docs/uksc-2018-0214-judgment.pdf
43. Tong, S. (2022, February 16). *The 'No License, No Chips' policy: When a refusal to deal becomes reasonable*. DePaul Business and Commercial Law Journal. Available at SSRN: https://ssrn.com/abstract=4036773 or http://dx.doi.org/10.2139/ssrn.4036773
44. World Intellectual Property Organization. (2008). Standards and patents (Document SCP/13/2). Retrieved from https://www.wipo.int/edocs/mdocs/scp/en/scp_13/scp_13_2.pdf
45. World Intellectual Property Organization. (2024). WIPO strategy on standard essential patents (SEPs) 2024-2026. World Intellectual Property Organization. https://www.wipo.int/edocs/pubdocs/en/wipo-pub-rn2024-12-en-wipo-strategy-on-standard-essential-patents-2024-2026.pdf

Further Reading

1. ECIPE (European Centre for International Political Economy). (2017). Standard essential patents and the quest for faster diffusion of technology. https://ecipe.org/wp-content/uploads/2017/10/Standard-Essential-Patents-and-the-Quest-for-Faster-Diffusion-of-Technology.pdf
2. European Commission. (2023). Proposal for a regulation on standard essential patents. https://single-market-economy.ec.europa.eu/publications/com2023232-proposal-regulation-standard-essential-patents_en
3. European Parliament. (2019). The regulation of standard essential patents and its effects on competition. https://www.europarl.europa.eu/RegData/etudes/IDAN/2019/608854/IPOL_IDA(2019)608854_EN.pdf
4. Government of India, Department of Industrial Policy and Promotion, Ministry of Commerce & Industry. (2016). Discussion paper on standard essential patents and their availability on FRAND terms. Retrieved from https://dipp.gov.in/sites/default/files/DiscussionPaper_SEP_FRAND.pdf
5. Lerner, J., & Tirole, J. (2013). Standard-essential patents (NBER Working Paper No. 19664). National Bureau of Economic Research. https://doi.org/10.3386/w19664
6. WIPO (World Intellectual Property Organization). (2024). WIPO strategy on standard essential patents 2024-2026. https://www.wipo.int/edocs/pubdocs/en/wipo-pub-rn2024-12-en-wipo-strategy-on-standard-essential-patents-2024-2026.pdf