



Navigating the 5G
patent landscape
Mapping the road
ahead



Ushering in the 5G patent landscape

5G is poised to transform operations across industries and contribute more than \$2 trillion to the global economy during the next 15 years.¹ The role of 5G will soon be vast, connecting not only mobile devices but an entire Internet of Things (IoT) across societies and businesses. The number of global connections is forecast to surge from 10 million in 2020 to 1.4 billion by 2025, by which point over a third of the world will have 5G coverage.² Nearly nine in ten businesses expect advanced wireless technology, including 5G and the latest WiFi standards, to transform their organizations and their industries within three years.³

The sectors likely to be most urgently impacted by these developments will be those with high-value equipment continually network-connected and needing to process large volumes of data, which will include manufacturing, energy, utilities, health care and MedTech. In factories, 5G will link industrial machines and robotics, enabling remote control, monitoring and repair, as well as automation. Energy and utilities firms will count on the standard to handle big data in the field, from smart grids to remote control of drones. Hospitals and medical device makers will use 5G to provide information to an array of tablets and fixed machines, and to empower robotic surgery.⁴

Industries as diverse as agriculture and finance are also expected to benefit from enhanced capabilities around monitoring and automation,⁵ while retailers will increasingly turn to virtual reality experiences and shipment tracking⁶ to emerge stronger from the

COVID-19 pandemic. The gaming industry, and in general augmented and virtual reality applications, will use multi-edge computing and the low latency features of 5G. Media firms will increase mobile streaming speeds and quality, as transportation operators rely on 5G to harness smart city infrastructure. These shifts will happen quickly as advanced wireless standards replace existing protocols, over the coming two to three years.⁷

In this fast-moving, high-investment context, it should be expected that telecommunications patent holders will seek to actively monetize their patents, covering 5G concepts and designs deemed essential to the standards. Any business deploying these technologies would be wise to consider how to reduce its operational risk and cost exposure by moving from a reactive to a proactive approach around 5G patents. Many businesses that will embrace 5G, however, have limited experience in accessing and negotiating telecoms patent licenses. At a baseline level, an understanding of the overall patent landscape and the most relevant patents are essential to enable the seamless adoption of 5G, sustaining profitability and protecting the ability to sell new products and services with adequate access to the necessary third-party patent rights. This report examines the core considerations and the crucial next steps businesses can take to navigate the 5G patent landscape.





Charting the course

Businesses planning to use 5G technology to improve their services and their performance need to consider how ever-expanding sets of relevant patents may affect their ability to operate.

The number of patent families declared to standardization bodies as standard essential (SEP), meaning those that have to be practiced by anyone implementing the 5G standards, has already reached the tens of thousands. There is considerable debate as to which company has the highest number of SEPs but it is clear that several of the most active have thousands of patents. Some of them include Ericsson, Huawei, LG, Nokia, NTT DOCOMO, Qualcomm, Samsung and ZTE. Patent declarations are being lodged in myriad realms, from radio layer designs and architecture to security, smart cards and applications.⁸

Media reports suggest the extensive patenting being undertaken raises the risk of legal battles, especially given the diversity of potential use cases, the significant expected technological

adoption, and the large license fees being floated. For example, Huawei has agreed to pay Qualcomm \$1.8 billion to cover catch-up license fees and for a new six-month license.⁹ There are also high-profile examples of favorable outcomes for telecommunications patent licensors, such as the UK Supreme Court judgement in the Unwired Planet case, which sets established law around what is considered 'fair, reasonable and non-discriminatory' (FRAND) licensing terms on a global basis.¹⁰

It is unlikely these financial, commercial and legal risks will deter business adoption, however, companies will generally consider the costs involved in accessing and commercializing the technology, with charges ultimately being passed onto consumers—as has been the case with 4G, leaving buyers largely unfazed. That said, the complexity of the risks and potential charges merits urgent examination by businesses in several areas.

The first aspect for businesses to consider is the likely practice of patent licensors. With

5G expanding the scope of mobile data communications from handsets to powerful devices in all areas of business and society, developers will expect to reap 5G royalties from a wide range of new areas. US and European courts have already rejected several claims that patent enforcement restricts competition, saying holders can demand license payments or limit usage for those who refuse to comply.¹¹ The reality of doing business with active licensors is that they will seek to extract substantial payments for usage rights, although, of course, they are bound by standards bodies to FRAND terms as they attempt to do so.

The second key focus is recognizing where in the value chain the issuance of patent licenses is likely to be concentrated. The answer will usually be wherever the most lucrative opportunities are to be found, and this will often be in line with the costs of the end product. As an example, in practice, in the automotive industry, some estimates suggest up to \$30 per car could be charged for the use of patented 5G systems—a fee that can be derived from the high price of cars. Recently, a court upheld Sharp's request to limit Daimler sales in Germany for using its connection technology without a license.¹² The liability for the car maker, rather than the producer of the connected console, indicates a desire to capture the stronger revenue opportunity. Similar moves should be expected in other industries.

Thirdly, it is important to consider the costs of the entire 5G patent stack, across licensors, devices, industry applications and locations, reflecting this in operational budgets and in the price points of products being sold. 5G patents are not limited to SEPs—there will be 'implementation' patents, which are also widely implemented and which patent holders are likely to license. Indeed, Qualcomm already offers different license tiers depending on whether non-SEPs are included.¹³

Patent holders may take different approaches to identifying value as they seek licenses, as with the example of having novel technology in newly-made cars, of which 500 million connected autos are expected on the road within five years.¹⁴ Charges will vary considerably: in the context of smartphones, 5G patent holder Qualcomm is understood to take up to 3.25% of the device's price, which on a \$700 phone equates to a ceiling of \$22. Ericsson and Nokia, meanwhile, reportedly expect to charge fixed fees per handset of \$5 and \$3.50 respectively.¹⁵

Finally, armed with an appropriate understanding of the technology, patent and licensing landscape, businesses must decide whether to take a proactive or reactive approach to 5G patents. For companies using or implementing 5G-powered systems there is a major opportunity to actively stave off patent risks and build an effective, balanced business model. By contrast, some firms could be reactive, usually the result of short-term legal and budgetary caution. Industry examples show consistently that being proactive can cost far less and provide significant value enhancement.

Deloitte IP Advisory analysis of the costs associated with processing incoming licensing requests, regardless of the outcome of such approaches, starkly demonstrates the financial and operational benefits of choosing to act early. It is estimated that, on average, companies that choose to only react to incoming licensing demands can expect to spend five times more in net present value terms, regardless of the outcome, than companies that choose to invest in proactive cost and risk management initiatives. Operationally, a purely reactive approach also results in heavily diminished control and reduced market leverage, plus significant senior management distraction.



Future actions

In all sectors, progressive companies are beginning to take a more proactive approach to 5G patents, preparing to maximize value and manage risk and cost exposures, instead of purely reacting to enforcement actions. Proper usage of SEP and non-essential patents involves entering a commercial negotiation, and it is important to be armed with robust arguments and evidence, acting practically and with objectivity.

Companies implementing and rolling out 5G solutions can succeed by preparing specifically in three areas—risk analysis and mitigation, financial considerations, and IP development. These are the core steps for each:

Risk analysis and mitigation

- Develop a robust understanding of SEPs relevant to intended use cases
- Perform a targeted IP risk assessment for key aspects of your offering, including SEPs, non-SEPs and non-5G technologies
- Consider the full breadth of risk and cost mitigation options, such as supplier indemnification and insurance, but beware of their limitations
- Design and implement appropriate IP defense strategies

Financial considerations

- Consider potential IP royalties and other license fees throughout product cost and pricing models
- Construct robust economic arguments for IP negotiations

IP development

- Develop a patent portfolio and ensure it remains fit for purpose
- Consider acquiring patents strategically
- Secure IP rights, or third-party access to them, as early as possible in development

It is clear that carefully utilizing 5G technology will transform businesses' operations across industries. Thorough preparation and focused steps are essential. Knowledge and experience in risk analysis and mitigation, financial planning, and IP development and transactions, is helping companies in all sectors address these challenges, unlocking new business opportunities, improving operations, accessing critical IP and maximizing profitability.

Contacts



Jon Calvert

Partner IP Advisory | Advisory Corporate Finance | Deloitte LLP

D: +44 20 7303 5545 | M: +44 777 150 4295

jcalvert@deloitte.co.uk



Josue Ortiz-Ramirez

Director IP Advisory | Advisory Corporate Finance | Deloitte LLP

D: +44 20 7007 4866 | M: +44 778 683 3215

jortizramirez@deloitte.co.uk



Natalia Muska

Manager Marketing & Business Development IP Advisory |
Advisory Corporate Finance | Deloitte LLP

D: +44 33 0138 1875 | M: +44 753 852 2293

nataliamuska@deloitte.co.uk

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