

Consultation Title	6G Strategic Vision
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Geographical Scope	Radio Spectrum Policy Group
Co-signatories	Amazon Inc., Apple Inc., Broadcom Inc., Cisco Systems Inc., Hewlett Packard Enterprise, Meta Platforms Ireland Limited
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Dear Colleagues,

The undersigned companies, representing an important cross-section of the world's leading silicon vendors, system manufacturers and application providers, welcome the opportunity to comment on the RSPG Draft Report on the EU's 6G Strategic Vision.

Introduction

In the draft report, the RSPG considers 6G use cases and usage scenarios, coverage and capacity requirements, as well as spectrum needs to support the initial launch and operation of 6G networks/services the RSPG expects to commence in 2030. The draft report acknowledges that 6G will include not only the densification of mobile networks, but also the integration of IMT networks together with fixed broadband networks delivered to end-users' terminals by WAS/RLAN operating in licence-exempt spectrum, Non-Terrestrial Networks (NTN), as well as private mobile networks. It further recognises that sustainability and security are important considerations that will impact the design and deployment of different types of 6G networks.

The undersigned companies support efforts to plan for 6G in anticipation of the new use cases and increased competitiveness that such networks are expected to offer. These include services such as immersive communications, massive communications, Higher-Reliability and Low-Latency Communication (HRLLC), ubiquitous connectivity, and, potentially, AI and Communication.

While additional capacity is a requirement to realise future 6G use cases, we recognise that increased capacity alone will be insufficient to justify the investment that the development and implementation of 6G networks will necessitate. As we saw occur with the introduction of 5G, without new and compelling use cases driving the adoption of new technology, we run the risk of, once again, making premature decisions and investments without the prospect of a medium-term return, leading to slower deployment and uptake.

Technology-Neutral Approach

For these reasons, we urge RSPG to take a technology-neutral approach to 6G planning by considering carefully the realistic usage and spectrum requirements for different technologies and services that will contribute to the realisation of the 6G vision and avoiding the pitfalls of carving out new greenfield bands solely for the introduction of the latest version of a single technology. The connectivity goals proposed to be addressed by 6G cannot be supported by a single band or a single technology.

Innovation responding to end-users' needs

The RSPG draft report suggests that 6G deployment would enable EU innovation and digitalisation. However, this is not necessarily the case. The deployment of a specific technology or network does not

inherently lead to innovation. Innovative use cases typically arise from end-user demand and the emergence of novel services. Successful innovation and digitalisation, which bring social and economic benefits, will naturally drive corresponding connectivity needs.

While improved connectivity may foster innovative use cases, tying and tying innovation to a specific technology or business model is counterproductive. For example, public 5G networks were expected to unlock many innovative use cases, but this has not materialised as anticipated. Instead, innovation has largely relied on connectivity solutions such as RLANs, short-range devices, and private 5G networks, leveraging the most appropriate network for each requirement.

While 6G is likely to enhance mobile connectivity, it is unlikely to enable EU innovation or digitalisation by itself. Support for 6G should be contingent upon evidence from proponents of innovative use cases or digitalisation that additional mobile connectivity is specifically required to address unmet needs. At present, the drive for 6G appears to originate from technology/equipment providers, which may not fully align with end-user requirements or market demand.

Broader Engagement on Sustainability

In line with the EU's sustainability goals, we recommend that the RSPG also consider the long-term environmental impacts of spectrum allocation. Specifically, licence-exempt technologies such as Wi-Fi offer an energy-efficient way to meet the growing demand for indoor connectivity (if appropriately resourced, i.e. having access to the full 6 GHz band), thereby contributing to achieving the EU's Green Deal objectives. The ability of these technologies to offload data traffic from mobile networks reduces the overall energy consumption of 6G systems, making them a sustainable and scalable solution. By prioritising these energy-efficient technologies alongside licensed spectrum, Europe can advance its connectivity infrastructure while aligning with its sustainability commitments.

Diversity in Spectrum Usage

It is widely recognised that ubiquitous outdoor coverage cannot be economically achieved at higher frequencies, necessitating the use of lower bands for mobile 6G, supplemented in the future by non-terrestrial networks (NTN). Similarly, high-performance indoor connectivity from outdoor mobile networks will be impossible to achieve in higher frequency bands, particularly as buildings become more thermally efficient, necessitating the use of technologies and bands better suited for high-capacity indoor environments, such as Wi-Fi operating in the full 6 GHz band.

Concerns About the Upper 6 GHz Band for IMT

While some consideration has been given to a potential use of the upper 6 GHz band for the introduction of mobile 6G networks, namely IMT, the band's utility will be limited for that purpose. First, the upper 6 GHz band can only deliver additional mobile capacity for urban areas, given the economic infeasibility of using higher bands for wide area coverage. Second, of the services expected to be delivered by 6G networks, only one – immersive communications – may require additional capacity outdoors. Third, much like what occurred with 4G and 5G, the introduction of the latest generation of IMT will likely occur in bands already occupied by earlier versions of IMT (i.e., 1.8 GHz, 2.1 GHz, 3.5 GHz) rather than in greenfield bands¹. Fourth, other countries, including the United States, Canada, and South Korea (some of which are members of NATO), are considering bands other than the upper 6 GHz band for the mobile component of 6G, making reliance on this band alone for Europe's 6G strategy risky from a market fragmentation perspective. Fifth, in light of the amount of spectrum the mobile infrastructure vendor community claims will be necessary (between 500-750 MHz per MNO of new

¹ Not all the 5G pioneer bands have been assigned in all Member States or widely used. As for the latest 5G Observatory report (June 2024), only 12 Member States have assigned the 26 GHz band. Also, as the RSPG notes, years after the launch of 5G, where the 26 GHz band has been assigned, deployments are still in an early phase.

mid-band spectrum²), there is insufficient spectrum to support demand using only the upper 6 GHz band. Finally, were the upper 6 GHz band reserved only for IMT operations, this would significantly degrade the benefits of other connectivity solutions, such as fibre + Wi-Fi (which are inherently better suited to deliver high-performance indoor connectivity in a more energy-efficient and sustainable way), without providing any advancement towards the capabilities expected to be delivered by IMT-2030.

Network Convergence

Accordingly, we recommend that RSPG plan for the convergence of different networks using different bands to achieve the vision laid out for 6G. Specifically, we recommend that RSPG encourage 6G innovation in network convergence through solutions such as Passpoint³ and OpenRoaming⁴. These solutions would provide numerous significant benefits for connectivity operators⁵ and end-users⁶.

While IMT networks will need spectrum that appropriately addresses their requirements (mobility, wide area coverage, etc...), other 6G network components that can most effectively achieve indoor capacity objectives, including traffic offload from mobile networks, should be supported by technologies and bands best suited for providing high indoor capacity in a sustainable way. As such, the high-performance connectivity needed indoors is best delivered by licence-exempt technologies in the full 6 GHz band.

Role of Licence-Exempt Spectrum

It is also worth observing that mobile networks are not the only systems that will have spectrum requirements that should be addressed as part of 6G planning. Licence-exempt technologies continue to evolve and will play multiple important 6G roles, which also require spectrum. Offloading 6G mobile traffic to licence-exempt networks is one important use case, but is not the dominant one by far. Licence-exempt spectrum supports a variety of use cases (e.g., schools, universities, hospitals, enterprises, stadiums, factories, warehouses, and homes). Indeed, licence-exempt technologies are the most widely implemented connectivity solution in Europe, delivering more than 80% of data traffic in most European countries and available in practically all terminals.

The report “The future of European competitiveness” (a.k.a. the “Draghi report”) underlined the need to seriously assess the need for licence-exempt spectrum.⁷ It is imperative that RSPG do not focus exclusively on licensed spectrum for 6G but also develop recommendations that can support further growth of all the use cases that rely on licence-exempt spectrum.

Based on the points raised above, we propose the following key recommendations for RSPG’s 6G strategic planning:

- **Adopt a Technology-Neutral Approach:** Ensure that the RSPG’s spectrum roadmap allows for a diversity of technologies to coexist and supports a balanced mix of licensed and licence-exempt spectrum.

² In [CEPT PTA\(23\)047](#) mobile infrastructure vendors state, “According to the analysis, the estimated additional wide-area spectrum need per network would be ~500 to ~750 MHz depending on the existing mid bands spectrum available for IMT and on the number of networks in a specific country.”

³ <https://www.wi-fi.org/discover-wi-fi/passpoint>

⁴ <https://wballiance.com/openroaming/>

⁵ Including efficient network offloading, reduced operational costs, better Wi-Fi utilisation, scalability, enhanced security, new revenue opportunities, and improved customer retention.

⁶ Including seamless and secure connectivity, automatic network connection, hassle-free global roaming, consistent high-quality service, cost savings, and broad accessibility to global Wi-Fi networks.

⁷ The report provides the following recommendation: “Include the release of additional WiFi-dedicated bands into the spectrum guidelines, to allocate enough spectrum to 5G and 6G, while preserving the viability of private WiFi in the long term”. Page 75 – [Source](#).

- **Encourage Spectrum Convergence:** Promote the convergence of different networks using different frequency bands, with a particular focus on integrating solutions such as Passpoint and OpenRoaming to deliver seamless connectivity across mobile and fixed networks.
- **Leverage the full 6 GHz Band for Indoor Connectivity:** Support the use of the full 6 GHz band for high-performance, licence-exempt indoor connectivity, particularly for environments such as universities, hospitals, and businesses that require efficient, sustainable solutions.
- **Broaden the Focus to Include Licence-Exempt Spectrum:** Recognise the critical role of licence-exempt spectrum in supporting a wide array of use cases. Develop recommendations that not only cater to licensed spectrum needs but also foster the growth and sustainability of services that rely on licence-exempt spectrum.

Conclusion

We strongly encourage the RSPG to take a balanced approach that considers the technological and economic realities facing the European connectivity ecosystem. Rather than taking a rigid stance on one solution or another, the EU's 6G strategy should recognise the value of a flexible spectrum landscape that can evolve alongside future technological innovations. By maintaining an open, inclusive, and collaborative tone, we can ensure that the resulting framework will support both industry growth and broader societal needs, while also fostering international cooperation. This approach will ultimately contribute to the successful and sustainable deployment of 6G in Europe.

/s/

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