

Draft RSPG report on 6G Strategic vision





Ericsson appreciates the efforts of the RSPG in supporting the Union to secure spectrum resources for the deployment of 6G technology and for providing the possibility to contribute to this process.

Spectrum availability is a key element to realizing the objectives and vision of the Union's large investments in 6G research. Smart Networks and Services Joint Undertaking (SNS JU) announced a 127 million EUR funding boost in 2024 to advance the next-generation communications networks and services, with EU investing more than €500M to boost 6G research and innovation [[HOME - SNS JU](#)]

We strongly support the RSPG to develop a *6G spectrum roadmap during its next working period (2026-2027) in order to identify which frequency band(s) should be made available for the launch of 6G*. This roadmap should also look into enabling large-scale 6G use cases. The 6G spectrum roadmap should strengthen European competitiveness and technology leadership.

Spectrum needs and frequency bands:

Networks deployed by 2030 are expected to benefit from a more spectrally efficient technology and thus gradually migrate to 6G as per market needs. This is already today a common practice and is expected to continue. However, even if the spectrum available by 2030 in low, mid and high bands would be used by 5G and 6G, this will not be enough to enable both the enhancements of 5G (5G-Advanced) and the 6G vision.

A 6G roadmap should take into consideration spectrum needs and in particular, how much spectrum would be required for Europe to address current traffic forecast and to enable the full potential of 6G technologies.

Technology neutrality regulations will enable network upgrades in current harmonized frequency bands to the latest technologies, as per market request. Therefore, a 6G roadmap should not include existing harmonized spectrum (low, mid, high bands) and instead focus on new frequency bands.

Ericsson recommends RSPG to focus on wide-area spectrum as this brings the largest societal benefits, including critical use cases in wide areas, such as autonomous driving or digital twins. Our calculations conclude that 3 GHz of wide-area spectrum would be needed for 6G¹. This would mean that even in the most optimistic scenario of utilizing all currently EU harmonized mid-band spectrum² for 6G, more than 2 GHz of additional wide-area spectrum would be needed. This gap cannot be closed by one single frequency band.

Full fledged 6G is not expected from day one, it is rather an evolution. Initial 6G deployments should have available at least 200 MHz of contiguous spectrum per

¹ 6G spectrum - future mobile life beyond 2030 - Ericsson.

² Note that in this simplistic calculation, we have not taken into account the current traffic growth.



network (i.e. double the capacity that is typically available in the C-band). While additional spectrum needs for these initial 6G deployments may be satisfied by a single frequency band, further considerations of additional spectrum are needed to support the development of 6G.

Ericsson recommends the RSPG to facilitate full power macro base station deployments in the upper 6 GHz band (6425-7125 MHz) for 5G-Advanced and initial 6G, as well as to include the 7125-8400 MHz range (not only limited to 7125-7250 MHz) as a candidate band for large-scale 6G use cases.

We agree with the RSPG regarding the uncertainties in significant part of the 7125-8400 MHz range, and therefore, Europe should secure the upper 6 GHz for full macro base station deployments while following the international developments on 7125-8400 MHz, both in ITU-R as well as in the U.S., noting that the latter is studying opportunities in this range while considering both existing federal and non-federal usages³.

Ericsson is of the opinion that any additional spectrum considerations for local usage (i.e. targeting vertical use cases) should be assessed once deployments mature. In addition to the recently harmonized spectrum range 3.8-4.2 GHz for local connectivity, verticals can benefit from mmWave and be addressed by public networks. It is still too early to conclude that “*The spectrum need for local and vertical use will still increase*”, as stated by RSPG. We expect near term 5G local deployments in this band, noting that upgrades to 6G as well as 6G deployments will be driven by market needs.

While additional spectrum is needed in urban areas, Europe should be conscious of ubiquitous connectivity and digital equality. This requires nationwide spectrum. Following the example of the 5G roadmap which considered low, mid and high bands, Europe should enable additional capacity in rural areas with sub-700 MHz. **The 6G roadmap should include provisions for the 470-694/8 MHz frequency band.**

The sub-THz range can uniquely offer the Terabits per second (Tbps) speeds and extremely low latencies that will be key enablers for niche 6G use cases. However, even if currently interesting from a research perspective, is not mature enough for commercialization, neither in terms of business case nor radio components. Thus, we do not expect it to become part of the first wave of 6G, although it may become relevant in the longer term. **At this stage, the sub-THz range should not be included in the 6G roadmap.**

Densification:

RSPG emphasizes that *no new harmonised band is foreseen to be available for use prior to 2030. To cope with the growth of 5G market, number of mobile*

³ [National Spectrum Strategy Implementation Plan \(3.12.24\) \(ntia.gov\)](#)



operators mainly in the most populated European countries should densify their 5G network in various harmonised bands.

Densification is a common practice today to address traffic growth depending on needs and possibilities to deploy additional sites. This will continue not only up to 2030 but beyond. However, **densification alone will not be able to open for any new use case in Europe up to 2030**. A hot new use case is AR. Ericsson analyzed the impact of AR in mobile networks towards 2030 and demonstrated that densification alone is not enough but additional mid-band spectrum is necessary to address this use case⁴. Without new spectrum before 2030, Europe will increase the technology gap towards other markets, making it more difficult for Europe to lead on 6G.

Sharing:

Inter-service sharing has become increasingly important due to scarcity of spectrum resources. Co-existence between mobile and existing primary incumbent services needs to be ensured to unlock new spectrum bands for IMT above 7 GHz. This is now a key moment in time as 6G has not yet been neither designed nor standardized. **An EU mandatory regulatory requirement in ETSI (as mentioned by RSPG) will not address the inter-service sharing problem.** Instead, the EU should focus on enabling collaboration across services and seek for global consensus. A single solution cannot be expected, depending on the nature of the sharing solution, different measurements would be needed.

Cross technology sharing, also known as intra-service sharing, is a more complex discussion, in particular when mixing licensed and unlicensed regimes as these are fundamentally different. While licensed mobile operation requires reliable spectrum for QoS and investments, unlicensed/license exempt users use free spectrum on a best effort basis. **We recommend RSPG to analyze the complexity, cost and benefits of each individual solution for cross technology sharing before considering an EU mandatory requirement to ETSI.**

Direct-to-Device satellite communication:

Mobile networks today reach most of the European society. Direct-to-Device satellite communication should be analyzed and considered as part of the 6G roadmap to enhance connectivity and reach those few places not covered towards Global broadband (100 % coverage). However, ensuring a complementary role to terrestrial networks and their protection.

⁴ AR uptake enabled by mobile networks, [ericsson-mobility-report-june-2023 \(3\).pdf](#)