

RSPG Opinion on a Radio Spectrum Policy Programme (RSPP)

Nokia's response to the Draft RSPG Opinion

Nokia welcomes the opportunity to comment the RSPG Opinion on the new RSPP. This response is complementary to those provided via the industry association of which Nokia is member, namely GSA and DIGITALEUROPE. It should also be considered in conjunction with the responses to the Opinions on Additional Spectrum Needs and Spectrum Sharing – Pioneer initiatives and bands.

Nokia sees digitization as a cornerstone of the economic recovery and further progress of the society. We therefore consider the RSPP to be critical as it is setting the EU spectrum policy goals and frame for the next decade. Accordingly, the RSPP should be sufficiently forward-looking to encompass ongoing and future technological developments, including the 5G and its evolution and the associated spectrum needs. Access to spectrum resources is expected to become even more relevant for many industries in the upcoming period and its use to achieve the societal value, based on a harmonised framework centred on the EECC, should be the overarching target.

Nokia welcomes the opportunity to provide comments to the RSPG consultations on the draft RSPG opinion on RSPP and expresses hereinafter our views on specific topics of relevance to the wireless technologies and networks.

2. Strategic Spectrum issues

2.1. Spectrum Sharing

The wireless broadband is the cornerstone of connectivity for citizens and businesses worldwide and this tendency will continue in the coming years. Availability of affordable spectrum will play a key role in meeting the demand for ubiquitous coverage and capacity, leading to heavy network investments to provide quality of service and reliable wide area services. Consequently, exclusively licensed spectrum should remain the key method to assign spectrum to mobile operators that need certainty when planning their investments and network rollouts. This is valid for both spectrum for access and backhaul capacity.

As clearing additional spectrum bands becomes increasingly difficult, shared spectrum will likely respond to, and complement, the spectrum requirements for wireless connectivity. Spectrum sharing, while high on the RSPG's agenda, should remain a complement to the exclusive licensing model and not a competing or replacing alternative. To this end, sharing frameworks should be carefully designed to address the needs of the mobile operators and industries, while protecting

the incumbent users. Early engagements with stakeholders should result in clearly defined sharing frameworks subject to least restrictive conditions, provide predictability, and help interested parties in planning their strategies and the investment-related decisions.

Solutions including those relying on databases can improve coordination between services, minimizing the required separation and risk for interference, reducing restriction zones, and optimizing thus the use of the spectrum. To this end, solutions like Automated Frequency Coordination (AFC), for example, as the FCC is implementing in the USA in the 6 GHz band can have as benefit the use of the band with higher (standard) power by the unlicensed users. Multi-tiers solutions such as CBRS, should be evaluated within the national context that led to its development, and take into account the addressable market. Transposing such solutions in national markets within Europe requires local customization and needs to be justified by market demand.

The IMT networks, on the other hand, are already using highly sophisticated spectrum sharing systems to improve performance – cellular frequency re-use, scheduling techniques, network slicing, dynamic spectrum sharing (DSS) – to name a few. 3GPP technologies like MOCN are available to implement intra-service sharing schemes between IMT networks, ideally subject to market-led arrangements.

Spectrum sharing solutions as mentioned in the Opinion – spectrum pooling, “use-it-or-share-it”, network slicing – are already possible under the EECC framework, via 3GPP standardised solutions (e.g., MOCN) or through enhancement of secondary markets to allow spectrum transaction between spectrum licensees and spectrum seekers.

In line with the EECC provisions, Nokia sees value in the enhancement of the secondary markets at the Member States level to encourage market-led spectrum transaction between spectrum licensees and spectrum seekers.

Forward looking towards the 2030s and aligned with Nokia Bell Labs’ vision on the future developments of the IMT technologies, we acknowledge that new trends are emerging in shaping the 6G system requirements and technologies to transform the communication experience and the interaction with the physical world. The rapid advances in artificial intelligence make it likely to become an important component for the 6G air interface and network. Other technology transformations in the 6G context include access to new (high) spectrum bands, self-adaptive spectrum sharing methods, extreme performance requirements on latency and reliability, to name a few. Moreover, going up in the spectrum frequency ranges towards the sub-terahertz bands (e.g., 90-275GHz), sharing and reuse of resources is to be considered and therefore adequate frameworks should be taken into account. These developments will have an impact in the resource management framework, including flexibility in spectrum licensing schemes, and the automation of the spectrum management tools will need to take into consideration the more dynamic aspect of spectrum access in space, frequency and time that 6G will require.

We recommend RSPG to take into consideration these trends and the necessity to ensure a regulatory framework that support such developments in the coming years, including affordable licenses for testing and research and facilitating access to sub-terahertz bands.

2.2. Licensing and Spectrum Awards

The individually nationwide licensed spectrum for exclusive usage under affordable conditions is key to enable national wireless connectivity and assure high-quality mobile services, while providing certainty of long-term investments in the mobile networks.

Spectrum for local licensing should be available to all interested parties and should not compromise the availability of nationwide licensed spectrum, with large contiguous blocks, for wide area/national IT networks.

Decisions to reserve spectrum in harmonised bands for local licenses, newcomers, etc., should be justified by detailed analysis on costs and benefits, taking into account the market demand, and should be subject to public consultations, to avoid the risk for a fragmented and inefficient use of the respective spectrum in the mid/long term.

Additionally, efficient secondary markets could enable efficiently more transactions between spectrum licensees and spectrum seekers on local basis, the later benefiting of access to harmonised spectrum and robust end-to-end ecosystems. This would be aligned with RSPG view on spectrum leasing which is deemed more efficient when market-led rather than imposed.

With regards to the licensing processes at the Member States' level, we consider that licensees could benefit from greater levels of automation as a means of reducing the time between the application for a licence, any required calculations for the management of interference, and the issuance of the licence.

3. Spectrum needs and supporting EU vision/policies

As the RSPG aims to support key Union policy areas such as the European Gigabit Society, the European Green Deal, New industrial strategy for Europe and Shaping Europe's digital future, ensuring spectrum availability is crucial. As different frequency ranges support different objectives, technologies and deployment models, we consider that the policy target of making 12 GHz available below 100 GHz for wireless services, including the already EU-harmonised spectrum, is too generic and fails to address specific needs.

Nokia does not share the RSPG's view that spectrum availability can be simply assessed by the overall quantity of spectrum available for innovative wireless services, and that there is "no need to define any quantitative target in RSPG to respond to EU policies". We encourage RSPG to develop strategic sectoral recommendations on long term spectrum needs/requirements and the Member States to align accordingly their plans and make spectrum available in a timely manner. Spectrum needs/requirements need to be considered distinctly in low, mid and high band as these bands serve distinct roles complementing each other. This would lead to a harmonised approach to the spectrum and reduce the risk of fragmentation.

The new RSPG should consider ensuring a timely and balanced access to additional spectrum to serve businesses and consumers, encouraging harmonisation and facilitating larger ecosystems through the development of band plans, associated technical rules and authorisation schemes that incentivise investment and innovation.

With respect to future spectrum needs for IMT, to deliver the widespread coverage and support all existing and new use cases and applications, additional spectrum is required across all frequency ranges – low, mid and high. Demands for additional spectrum for wireless connectivity

are carried over at international level by the mobile industry in the context of WRC-23 under the Agenda Items AI 1.2, AI 1.3 for mid bands and AI 1.5 for low bands.

- Low bands (below 1 GHz) can bring great benefits to achieve improved coverage, capacity and performance in sparsely populated areas and some suburban areas as well as in hard to reach locations (e.g., deep indoors). Beside enhanced mobile broadband services, low bands address a growing range of applications requiring good propagation characteristics in an economically efficient manner. Availability of additional UHF spectrum (in the 470-694/698 MHz range) in the mid-term for mobile use is to be considered and cooperation between broadcasting and mobile industry on effective win-win models and efficient use of this spectrum should be encouraged.
- Mid bands offer a balanced approach between coverage and capacity in the context of 5G deployments and will continue to play an important role in supporting the growing demand for capacity, addressing new 5G use cases, and delivering the required QoS. Nokia welcomes consideration of the 3.8-4.2 GHz and 6425-7125 MHz as potential mid-band resources to address the needs of both CSPs and verticals in the upcoming period while protecting existing applications and services.
- High bands demand is in its early stages. However, availability of mmWaves is key to meet the ultrahigh broadband speeds and capacity envisioned for 5G. As 5G networks continue to expand and the use cases to diversify, we expect the demand for high band spectrum to accelerate in the coming years as infrastructure, chipsets and devices supporting the 24.25-27.5 GHz band will be available this year. The RSPP should consider encouraging, incentivising, and maximising the use of the harmonised mmWave bands.

In the same context of the WRC-23, Nokia, as a founding member of the HAPS Alliance, is actively participating in the ITU preparations towards Agenda Item 1.4 on “HIBS”. We would welcome CEPT’s involvement and efforts to extend the use of the terrestrial IMT spectrum – to assure the coverage of difficult to reach areas by means of High Altitude Platforms solutions – in the already available national licenses in line with the principle of efficient spectrum usage.

The digitisation of industries will continue, and requests for spectrum to support such developments will increase in order to provide adequate indoor and outdoor connectivity for industrial premises, connectivity of sites, and mobility when necessary. As such, a combination of local and national services should be considered.

Spectrum needs should not be considered only for access technologies, but also for the wireless backhaul. Growing traffic and evolving network requirements will translate in additional request for backhauling spectrum, timely available under reasonable licensing terms and conditions.

In support to achieving the EU 2030 connectivity targets and other European strategies, RSPP should consider making available necessary spectrum resources including through early definition of the EU objectives for WRC-27 to identify target bands for the evolution of next-generation mobile and wireless access systems (such as IMT beyond 2020 and Wi-Fi).

4. Spectrum governance

4.1. EC-CEPT cooperation

Nokia acknowledges the cooperation between EC and CEPT and EC on strategic spectrum harmonisation and the role that RSPG plays. We also appreciate the improvements in the transparency and the increased dialogue with the industry over the last years.

4.2. National coordination/European coordination

From a telecom equipment provider perspective, Nokia considers that clarity in spectrum availability and award plans in the Member States, together with known conditions of the authorisation regimes and the associated technical characteristics, plays a key role to ensure the planning of the equipment development and supply in response to the market demands. As such, clear national roadmaps on spectrum availability can play an important role in increasing predictability of investments by CSPs and future network deployments.

4.3. Civilian/Military coordination

While securing spectrum for public order, security and defence purposes should remain a national competence, we support the recommendation to optimise such spectrum use through sharing with other users whenever possible and appropriate.

4.4. Standardisation and spectrum governance

With regard to harmonised standards, Nokia acknowledges their importance in facilitating the efficient spectrum use and management. As part of the industry, we are highly involved in the development of the 3GPP standards for networks, including high-performance of receiver and transmitter equipment.

We support measures that can increase the efficiency of spectrum use, such as the development of high-performance transmitter and receiver specifications.

5. External Relations

In terms of spectrum releases and cross-border network deployment, cooperation and coordination with neighbouring countries plays an important role, and RSPG's "good offices" is central to dealing with these aspects.

6. Other Policy areas with spectrum dimension

6.1 Migrating regulatory service obligations to the latest technologies

Nokia has been advocating for spectrum assignments under technology neutrality principle, assuming that the latest and most spectral efficient technologies are favoured. Technology and service neutrality are key principles that should continue to be central to the EU policy. Deviation

from this principle has to be carefully analysed, and decisions favouring specific services should always consider the use of state-of-art technologies.

Decisions to phase out older technologies (such as 2G, 3G) are part of the operators' strategies targeting best possible economic and spectrum efficiency. Member States and the Commission should encourage and support such actions.

6.2. Green New Deal / Climate change

In March 2021 Nokia announced our aim to reduce emissions by 50% across our own operations and our products in use between 2019 and 2030. Our new Science Based Targets (SBTs) fulfil our commitment to recalibrate our existing targets to align with a 1.5°C global warming scenario.

Nokia is an early adopter of the science-based targets methodology and were the first telecoms vendor to set science based approved targets in 2017 and among the first 100 companies across all sectors.

As already expressed in other RSPG consultations, Nokia agrees with the importance of the radio spectrum for the development of the electronic communications and broadband as basis of the digitization of the society and industries.

Any spectrum policy aspects related to ensuring climate-neutrality should consider already ongoing developments. Effective spectrum policy supporting climate actions should consider, for instance, the availability of sufficient spectrum resources, large contiguous spectrum blocks, and avoidance of unnecessary deployment limitations.

We reiterate our recommendation for RSPG to strengthen links with global standardization organizations (such as but not limited to ETSI, ITU) having working groups addressing environmental aspects that have undertaken work covering areas related to climate change (assessment methods, energy efficiency of systems, etc.). Any concrete actions that RSPG and the Member States will consider recommending should be aligned with proposals coming from this type of organisations.

6.3. EMF

Nokia supports RSPG's recommendations on continuing and increasing exchanges at European level on EMF issues. Common actions of RSPG and BEREC (i.e., coordinated campaigns on EMF-related issues) can help Member States to better address citizens' concerns regarding the compliance of general public exposure to radiofrequency limit values.

EMF limits should be reviewed and aligned with the revised ICNIRP guidelines. Stricter EMF limits (not science- and evidence-based) lead to inefficiencies in the networks rollout as they lead to degraded network capacity, higher deployment costs due to additional sites, unnecessary densification, and difficulties in fulfilling the coverage obligations.