



EUROPEAN COMMISSION

Directorate-General for Communications Networks, Content and Technology

Connectivity

Radio Spectrum Policy Group

RSPG Secretariat

Brussels, 10 February 2021

RSPG21-008 FINAL

RADIO SPECTRUM POLICY GROUP

**Additional spectrum needs and guidance on the fast rollout of future
wireless broadband networks**

DRAFT RSPG Opinion

Introduction

5G is the most important evolution of wireless broadband in the near future. The RSPG has developed three Opinions as its strategic roadmap towards 5G for Europe, in which it has identified 5G pioneer bands and addressed implementation challenges for 5G:

- RSPG Opinion on spectrum related aspects for next-generation wireless systems (5G), 30 November 2016¹,
- RSPG Second Opinion on 5G networks (Strategic Spectrum Road Map Towards 5G for Europe), 30 January 2018²,
- RSPG Opinion on 5G implementation challenges (RSPG 3rd opinion on 5G), 30 January 2019³.

The commercial launch of 5G in Europe has started. Within this work item, the RSPG further investigates additional spectrum and harmonisation needs (coverage, capacity and innovation) as well as authorisation regimes within the remits of the EECC for successful deployment, taking into account bands identified at WRC-19. The RSPG also raises questions on the measurement of EMF-limits (i.e. transparency and acceptance) related to the deployment of 5G networks.

¹http://rspg-spectrum.eu/wp-content/uploads/2013/05/RPSG16-032-Opinion_5G.pdf

²https://circabc.europa.eu/sd/a/fe1a3338-b751-43e3-9ed8-a5632f051d1f/RSPG18-005final-2nd_opinion_on_5G.pdf

³https://rspg-spectrum.eu/wp-content/uploads/2013/05/RSPG19-007final-3rd_opinion_on_5G.pdf

RSPG Survey on Additional Spectrum Needs, 5G Roll out, Authorization and EMF related Issues

The RSPG conducted a survey between 15 June and 21 August 2020 based on the Questionnaire in Annex I.

Responses were received by 25 Countries.

The results of the survey have been summarised in Annex II.

RSPG opinion / report

The RSPG:

1. Recognises that the current demand in the majority of MS for additional spectrum is mainly for the mid-bands.
2. Recognises that spectrum demand for verticals has been addressed in the mid-bands in a dissimilar way in MS, due to different national circumstances (eg. priorities for efficient spectrum use).
3. Recognises that there is a demand for vertical use in the mmWaves.
4. Recognises that there is no need for a dedicated designation for FWA in the mmWave bands, although operators should also have the possibility to address this application within their spectrum.
5. Recognises that different type of authorisation methods facilitate innovation and different technologies.
6. Recommends to investigate the possible use of the band 3.8-4.2 GHz for local vertical applications while protecting receiving earth stations and other existing applications and services.
7. Recommends that options should be developed for addressing vertical needs in the mmWaves, in order to facilitate consistent approaches.
8. Recommends that MS publish for transparency any available results of EMF exposure measurements.
9. Recommends that MS publish for transparency any available results of equipment SAR measurements.
10. Proposes to the European Commission to update EU Council Recommendation 1999/519/EC in order to take into account the revision of the ICNIRP guidelines.

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Annex I: Survey Questionnaire sent to RSPG participants

A. Identification of additional spectrum and harmonisation needs.

1. What is the interest in your country for 5G in the mm-wave bands (including the 26 GHz band)?
2. Has there been specific interest for developing next generation wireless broadband systems in harmonised spectrum (licensed or unlicensed) in addition to the 5G pioneer bands (700 MHz, 3.6 GHz and 26 GHz)? In what time frame?
3. Are there any specific bands that you have made available, including the 5G pioneer bands, but for which there is, so far, no interest from the stakeholders?
4. According to the available information in your country, which are the new 5G applications and services (other than broadband mobile) that will drive the demand for additional spectrum in the near future, and in which particular bands (including mm-wave)?
5. Have you initiated calls for input and/or consultation regarding the needs for higher mm-wave spectrum, including the 42 GHz band?
6. Do you expect any need for adapting the conditions applicable to the 57-71 GHz band?
7. How do you think that the ongoing 6G research and its impact on spectrum regulation should be considered at this stage? Do you consider a kind of light licensing regime?
8. In the long term, do you see additional spectrum and harmonisation needs for 5G / wireless broadband, and in which particular range of spectrum (low/mid/high)?

B. Roll-out of 5G networks

1. In the course of 5G new networks implementation have you had reports from operators facing difficulties in agreeing or applying synchronisation?
2. Which are the Key Performance Indicators you are using to evaluate the QoS and QoE level offered to the users and which are the indicators you use to monitor the fulfilment of roll-out obligations. Have you collected and/or analysed reports including QoS and QoE measurement results regarding pilot and/or commercial 5G deployments?
3. What are the obligations for the coverage of national road and rail corridors? What frequencies could be a solution for the coverage of national and cross-border road and rail corridors? Do you think that mm-wave bands above 24 GHz could be part of the solution?
4. Describe the different stages of the development of next generation wireless networks. Will they be mainly based on transitions to 5G, or on multi-mode/multi-band/multi-technology networks? What are the challenges you see for the spectrum usage in the anticipated scenario?
5. Which are the most important vertical industries in your country (with respect to their contribution to the GDP) that have expressed interests in using 5G in the mm-wave bands (above 24.25 GHz)?
6. If you are planning to make spectrum available for verticals and/or private networks; Which frequencies, and what allocation mechanism will you use, and why?
7. Are you in favour of co-existence between 5G and existing users in millimetric bands (i.e. 26 GHz, 42 GHz) or do you plan to progressively relocate the existing nationwide users (such as WLL and fixed-link operators in the 26 GHz band) in order to reduce sharing constraints?
8. Which are the spectrum bands, the geographical patterns, the scale and the time-plans that will dominate Small Cells deployment (i.e., base stations with EIRP up to 10 Watts) in your country?
9. Have you already made any considerations (including studies, informative-consultative actions, or necessary regulatory and legislative modifications) to simplify the licensing procedures for small cells, taking into account the forthcoming EC Implementing Regulation regarding a light deployment regime for Small Access Wireless Access Points (SAWAP)? Are you considering to facilitate operators and municipalities by publishing a list of small cell types or deployment examples (best practices) that meets the requirements of the EC implementing measure for small cells?

10. Do you have private LTE/5G networks deployments? If yes, please specify in more details e.g. in which segment (e.g industry, port, factory, RnD)? Are they using dedicated private LTE/5G frequencies or operator frequencies? Do you consider to reserve frequencies for direct use by private LTE/5G networks? What kind of service needs have been recognised?
11. Do you see that mobile broadband connection could be comparable to a FTTH connection?
12. What is the projected uptake of 5G for FWA and in which bands?

C. Authorisation regimes.

1. What is the preference for licensing the higher mm-wave bands (individual licensing, general authorisation, light licensing, etc.), in particular the 42 GHz band? Are you considering different authorisation regimes between outdoor and indoor 5G deployments, especially regarding the access to mm-wave bands?
2. Have you considered awarding spectrum with light local licenses to new entrants (niche players) to achieve fast provisioning of "on-site" applications over bespoke networks, especially in mm-wave bands? Have you identified the advantages and disadvantages (if any)?
3. Which are the spectrum bands and type of authorisations that you prefer to satisfy the demand for new services with different geographical orientation (local and/or wider area coverage).
4. Have you assessed the amount of dedicated spectrum for direct use by specific businesses (vertical sectors)? Have you already used any "spectrum trading" solutions for verticals?
5. Are you expecting 5G NR operations in unlicensed spectrum, as this is included in 3GPP studies and as defined in the 5G/R16 and R17 enhancements (especially, standalone operation at 5 GHz and/or 6 GHz bands)?
6. How do you currently consider spectrum sharing among operators in your approach to authorising bands and/or new users for 5G? Do you envisage specific changes/updates in the authorisation regime?
7. Do you have any plan for the introduction of dynamic spectrum access? What would be an appropriate authorization regime in the frequency ranges where you consider this approach is applicable?

D. EMF related issues.

1. Which are the health protection limits that you apply to EMF exposure of the public to 5G? In case they are different from ICNIRP, how is this justified?
2. Have you addressed how to simulate the EMF levels for 5G base stations using AAS? If so, how will you use the simulations?
3. Have you addressed how to measure the EMF levels for 5G base stations using AAS, in particular how to take into account the 6 min averaging? If so, how will you use the measurements?
4. Have you engaged in informing the public about EMF and 5G deployment? What is your plan to counter disinformation and fake news about 5G and health.
5. Have you collected and analysed results of EMF measurements relating to trials and/or commercial 5G operations? Have you published the results? Do you think a European campaign should be conducted?
6. Do you plan to monitor the SAR of smartphones? Would you like to share a common equipment SAR database?
7. As the ICNIRP published new guidelines in March 2020, should the EC revisit the Recommendation 1999/519/EC? Should the recommendation become a Directive?

Annex II: Survey Results Summary

I. Additional Spectrum and Harmonisation Needs

- The interest for further spectrum and harmonization needs in the near future is concentrated primarily around upper mid bands and possibly on low bands.
- Other than in the 5G pioneer bands, commercialisation has also been started in existing lower mid bands, like 1.8 GHz, 2.1 GHz or 2.6 GHz, while some interest has been expressed for the 2.3 GHz band.
- Regarding mm-wave bands:
 - Although some interest is identified for 26 GHz, large-scale developments are expected only in the future.
 - For higher bands including 42 GHz and 57-71 GHz the situation is premature: MS have not made decisions as yet at any aspect.
- Apart from eMBB, the Use Cases that will drive short term demand , are URLLC (industrial applications and V2X), mMTC (IoT), healthcare, 5G FWA in mid-bands. Long term demand for broadcasting (including coverage of local events) and PPDR is registered in sub-700 MHz bands.

II. 5G Networks Roll-out

- Low and mid bands seem suitable for roads and rail coverage.
- The development of next generation wireless networks will be progressive with multimode/multi-band/multi-technology operation
- Migration of existing users in the mm-waves seems to be preferable than co-existence.
- Small cells will likely be most used in urban areas and indoors implementing hot spots in the mm-wave (26 GHz) and mid bands (3.6 GHz)
- Most MS consider adopting (or have already adopted) a light licensing regime for small cells
- Some existing private LTE/5G networks operate in mid bands (2.3 GHz, 2.6 GHz and 3.6 GHz) and less in 26 GHz.
- MS use a wide range of KPI and QoS metrics starting with signal strength and simple data speeds and finally including more compound metrics. Indicatively:
 - DL/UL user data throughput rates, Mbps/cell/sector, 2-way latency, jitter, packet loss, SMS-related metrics, video-related metrics, Internet access, service availability
 - Blocking probabilities for voice calls
- This diversity from MS to MS may be a hint to focus on determining a least common set of 5G-related QoS/QoE metrics that could be agreed and accepted by the (majority of) MS.

III. Authorisation

- Light licensing for local spectrum users is being considered by the majority of MS.
- Spectrum identified and allocated with local license awards to vertical sectors to provide local services:
 - Several bands identified by some MS in mid bands: 2.3 GHz, 40 MHz in 2.6 TDD, the 5G pioneer 700 MHz (wide-area services), 100 MHz in 3.6 GHz (3700-3800 MHz or 3400 MHz edges preferred in many MS).

- For high mm-wave bands, some MS have identified 800-850 MHz in 26 GHz.
- For 42 GHz and 57-71 GHz: all regime options are under study, but no clear decision as yet.
- In the majority of MS, the regime currently applied for verticals is the same with that of national licenses subject to access obligations and spectrum leasing to foster such local users. Low potential recognized in spectrum trading.
- Studies are ongoing in many MS for options for spectrum reservations for local applications.
- Coordination between MS in cross-border applications has been identified as an issue.
- Due to low interest expressed by verticals most MSs have not considered dedicating spectrum for vertical use.
- Many allocation mechanisms to users for spectrum sharing have been identified by MS. In contrast, dynamic spectrum access mechanisms and their respective authorisation regime is not yet considered by most MS.

IV. EMF-related issues

- Majority of MS applies the public protection limits following EC 519/1999.
- Following the new ICNIRP guidelines, the MS majority is in favor of updating EC 519/1999. Some suggest turning it to a Directive
- Most MS are in favor of a EU common EMF measurement campaign