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Working Document

**Opinion of the RSC
pursuant to Advisory Procedure under Article 4 of Regulation
182/2011/EU and Article 4.2 of Radio Spectrum Decision 676/2002/EC**

Subject: Mandate to CEPT to review the harmonised technical conditions for certain EU-harmonised frequency bands and to develop least restrictive harmonised technical conditions suitable for next-generation (5G) terrestrial wireless systems

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MANDATE TO CEPT

TO REVIEW THE HARMONISED TECHNICAL CONDITIONS FOR CERTAIN EU-HARMONISED FREQUENCY BANDS AND TO DEVELOP LEAST RESTRICTIVE HARMONISED TECHNICAL CONDITIONS SUITABLE FOR NEXT-GENERATION (5G) TERRESTRIAL WIRELESS SYSTEMS

1. PURPOSE

It is anticipated that next-generation (5G) terrestrial wireless systems will operate in frequency bands that have already been harmonised in the EU for electronic communications services. While this is already possible today based on technology and service neutrality principles, it is important that the existing harmonised technical conditions of use be reviewed to identify potential constraints, and optimised for next-generation systems. The latter would contribute to a leading Union role in 5G development and deployment.

This Mandate is a follow-up to the Commission's mandate regarding technology-neutral harmonised technical conditions suitable for next-generation (5G) use for the 3.6 GHz and 26 GHz pioneer bands¹. It should deliver harmonised least restrictive technical conditions, including sharing conditions if needed, for next-generation (5G) terrestrial wireless systems in the EU-harmonised 880-915 and 925-960 MHz frequency bands ('900 MHz band'), 1710-1785 MHz and 1805-1880 MHz frequency bands ('1800 MHz band'), 1920-1980 MHz and 2110-2170 MHz frequency bands ('paired terrestrial 2 GHz band'), and 2500-2690 MHz frequency band ('2.6 GHz band')². These conditions should take into account relevant 5G usage scenarios related to wireless broadband and the Internet of Things, and meet the overarching purpose of ensuring efficient spectrum use.

2. POLICY CONTEXT AND INPUTS

The ITU-R vision for the next-generation mobile telecommunications³ outlines three major 5G usage scenarios – enhanced mobile broadband (eMBB), massive machine type communications (mMTC), and ultra-reliable and low latency communications (URLLC).

Deliverables of the 5G Public Private Partnership⁴ Infrastructure Association indicate that 5G would offer both an evolution of mobile broadband networks ensuring continuous user experience, and new unique network and service capabilities. In particular, 5G would be a key enabler for the Internet of Things and mission-critical services requiring very high reliability, ubiquitous coverage and/or very low latency. In this regard, use cases originating from connectivity to 'verticals' (i.e. vertical sectors such as transport, healthcare or media) are considered as drivers of 5G requirements from the outset with high priority, in particular within frequency bands below 6 GHz.

¹ Document RSCOM16-40rev3 of 7 December 2016

² Subject to Commission Decisions 2009/766/EC as amended by 2011/251/EC and (EU) 2018/637 (900/1800 MHz band), 2012/688/EU (paired terrestrial 2 GHz band), 2008/477/EC (2.6 GHz band)

³ In the ITU context of "International Mobile Telecommunications for 2020 (IMT2020)", s. ITU Recommendation: https://www.itu.int/dms_pubrec/itu-r/rec/m/R-REC-M.2083-0-201509-I!!PDF-E.pdf

⁴ See <https://5g-ppp.eu/>

In its 5G Action Plan⁵, the Commission advances action on the EU-level identification and harmonisation of 5G spectrum regarding pioneer frequency bands as well as **additional** frequency bands, based on the opinion of the Radio Spectrum Policy Group (RSPG).

In its two Opinions on "Strategic Roadmap towards 5G in Europe"⁶, the RSPG asserts the importance of existing EU-harmonised spectrum for the rollout of 5G terrestrial wireless systems in the Union as follows:

- 5G needs to be deployed also in bands already harmonized **below 1 GHz**, in particular the 700 MHz band, in order to enable nation-wide and indoor 5G coverage;
- there is a need to ensure that technical and regulatory conditions for **all bands already harmonized** for mobile networks are fit for 5G use.

In this regard, the 900 MHz and 1800 MHz, the 2.6 GHz and the paired terrestrial 2 GHz frequency bands are relevant EU-harmonised frequency bands for next-generation terrestrial wireless systems. In its 5G roadmap, the CEPT highlights the need to revise the technical conditions for these frequency bands with the goal to ensure their suitability for 5G use. Therefore, technical studies are necessary with view to enabling the use of these bands for next-generation terrestrial wireless systems, which use active antenna systems (AAS) and are capable of providing novel services or applications. These studies should consider terrestrial electronic communications services and other relevant use, and foster a European approach to 5G deployment, which benefits to the extent possible from global harmonisation. The CEPT also concludes in its 5G roadmap that the current technical conditions for the 700 MHz, 800 MHz and 1.5 GHz frequency bands are already suitable for 5G use in the context of technology neutrality and the anticipated lack of AAS deployment in those frequency bands.

In particular, for the 900 MHz and 1800 MHz frequency bands, it is relevant to consider a Block Edge Mask (BEM) approach to technical harmonisation, which is suitable for next-generation terrestrial wireless systems and achieves consistency with the existing minimal and least restrictive technical conditions for other EU-harmonised frequency bands for wireless broadband electronic communications services. Such an approach should replace in the long term the current technical framework based on references to ETSI standards for both bands. Furthermore, it should ensure coexistence with the GSM system in the 900 MHz frequency band, pursuant to the GSM Directive⁷, while delivering a solution, which ensures availability and efficient use of the spectrum for next-generation terrestrial wireless systems in line with the Union's spectrum policy priorities.

In this regard, the CEPT is considering an amendment of the current technical framework for the 900 MHz and 1800 MHz frequency bands in early 2019, in order to reference the latest technical standards covering 5G New Radio. The CEPT plans to adopt harmonised technical conditions on the basis of BEM for both frequency bands as the long-term regulatory approach⁸. Taking account of progressing 5G standardisation, a transition of the

⁵ See: <https://ec.europa.eu/digital-single-market/en/5g-europe-action-plan>

⁶ Documents RSPG16-032 final (9 November 2016) and RSPG18-005 final (30 January 2018)

⁷ Council Directive 87/372/EEC as amended by Directive 2009/114/EC of the European Parliament and of the Council

⁸ See CEPT 5G roadmap (document ECC(18)104 Annex 17) and ECC PT1 revised work programme (document ECC(18)104 Annex 19)

technical conditions to BEM in the 900 MHz and 1800 MHz frequency bands at the EU level, could be facilitated by the specific provision⁹ in the Decision 2009/766/EC (as amended), which allows in both bands use of *other systems*, which are not listed in its Annex, under the condition of ensuring coexistence with the GSM system and the systems listed in that Annex. The aforementioned amendment of the CEPT technical framework will facilitate compliance with this provision in the EU context in order to accommodate evolving 5G standards.

3. JUSTIFICATION

Pursuant to Article 4(2) of the Radio Spectrum Decision¹⁰ the Commission may issue mandates to the CEPT for the development of technical implementing measures with a view to ensuring harmonised conditions for the availability and efficient use of radio spectrum necessary for the functioning of the internal market. Such mandates shall set the tasks to be performed and their timetable. Pursuant to Article 1 of the Radio Spectrum Decision, activities under the Decision must facilitate policy making with regard to the strategic planning and harmonisation of radio spectrum use as well as ensure the effective implementation of radio spectrum policy in the EU while serving the aim of coordination of policy approaches. Furthermore, they shall take due account of the work of international organisations related to spectrum management such as ITU or 3GPP.

The Radio Spectrum Policy Programme (RSPP) requires Member States, in cooperation with the Commission, to take all steps necessary to ensure that sufficient spectrum for coverage and capacity purposes is available within the Union, in order to enable the Union to have the fastest broadband speeds in the world, thereby making it possible for wireless applications and European leadership in new services to contribute effectively to economic growth, and to achieving the target for all citizens to have access to broadband speeds of not less than 30 Mbps by 2020. Furthermore, the RSPP calls on Member States and the Commission to ensure spectrum availability for the Internet of Things (IoT) and to foster the development of standards and the harmonisation of spectrum allocation for IoT communications.

Advances in international standardisation at 3GPP and ITU, as well as rapid international developments regarding 5G trials and spectrum use until 2020, call for a swift and coordinated EU-level process on delivering sufficient and appropriate 5G spectrum in the Union according to anticipated deployment of 5G usage scenarios.

4. TASK ORDER AND SCHEDULE

CEPT is herewith mandated to develop harmonised least restrictive technical conditions for the 900 MHz, 1800 MHz, the 2.6 GHz and the paired terrestrial 2 GHz and frequency bands in line with the principles of technology and service neutrality, suitable for *next-generation (5G) terrestrial wireless systems* in line with the policy priorities set out in this Mandate and taking into account relevant needs for shared spectrum use with incumbent uses. CEPT should give utmost consideration to overall EU spectrum policy objectives such as effective and efficient spectrum use and take utmost account of applicable principles established in EU law such as those relating to service and technological neutrality, non-discrimination and proportionality insofar as technically possible.

⁹ Article 5 of Decision 2009/766/EC (as amended)

¹⁰ Decision 676/2002/EC of the European Parliament and of the Council of 7 March 2002 on a regulatory framework for radio spectrum policy in the European Community, OJ L 108 of 24.4.2002

CEPT is requested to collaborate actively with the European Telecommunications Standardisation Institute (ETSI), which develops harmonised standards for conformity under the Radio Equipment Directive. In particular, CEPT should take into consideration emerging technologies and ETSI harmonised standards, which define 5G systems, facilitate shared spectrum use or foster economies of scale.

More specifically, CEPT is mandated to perform the following tasks with view to creating sufficiently precise conditions for the development of EU-wide equipment:

1. Review the EU-harmonised technical conditions for use of the 900 MHz, 1800 MHz, paired terrestrial 2 GHz, and 2.6 GHz frequency bands with view to their suitability for 5G terrestrial wireless systems¹¹ which provide electronic communications services as well as other relevant services or applications, and assess the approach to adapting the EU-harmonised technical conditions for 5G use, if needed.

In particular, for the 900 MHz frequency band, such assessment should address any potential constraints (e.g. regarding efficient spectrum use), which result from the requirement to ensure co-existence with the GSM system, pursuant to the GSM Directive⁷.

2. Based on the results under Task 1, develop channelling arrangements and common and minimal (least restrictive) technical conditions¹² for the aforementioned frequency bands, which are suitable for 5G terrestrial wireless systems in compliance with the principles of technology and service neutrality.

These conditions should be sufficient to mitigate interference and ensure co-existence with incumbent radio services/applications in the same band or in adjacent bands, in line with their regulatory status, including at the EU outer borders.

3. Develop guidance for cross-border coordination.

Overall, the CEPT should provide deliverables under this Mandate according to the following schedule:

Delivery date	Deliverable	Subject
March 2019	<p>Draft Report(s) from CEPT to the Commission¹³ regarding the paired terrestrial 2 GHz frequency band, and the 2.6 GHz frequency band.</p> <p>Information on the usage feasibility of the 900 MHz and 1800 MHz frequency bands, including any limitations of the GSM Directive.</p>	Description of the work undertaken and the results.

¹¹ Such as based on the usage of active antenna systems

¹² Such as the definition of appropriate Block Edge Masks (BEMs)

¹³ Subject to subsequent public consultation

July 2019	Final Report(s) from CEPT to the Commission regarding the paired terrestrial 2 GHz frequency band, and the 2.6 GHz frequency band, taking into account the outcome of the public consultation.	Description of the work undertaken and the results.
July 2020	Draft Report(s) from CEPT to the Commission ¹³ regarding the 900 MHz and 1800 MHz frequency bands.	Description of the work undertaken and the results.
October 2020	Final Report(s) from CEPT to the Commission regarding the 900 MHz and 1800 MHz frequency bands, taking into account the outcome of the public consultation.	Description of the work undertaken and the results.

CEPT is requested to report on the progress of its work pursuant to this Mandate to all meetings of the Radio Spectrum Committee taking place during the course of the Mandate.

The Commission, with the assistance of the Radio Spectrum Committee and pursuant to Article 4 of the Radio Spectrum Decision, may consider applying the results of this mandate in the Union taking into account any relevant guidance of the RSPG.