



CEPT Report 78

Report from CEPT to the European Commission in response to the Mandate (Task 3, 66-71 GHz) to develop least restrictive harmonised technical conditions suitable for Next-Generation (5G) Terrestrial Wireless Systems for priority frequency bands above 24 GHz

Report approved on 5 March 2021 by the ECC

0 EXECUTIVE SUMMARY

This Report addresses Task 3 of the EC Mandate to CEPT to develop least restrictive harmonised technical conditions suitable for Next-Generation (5G) Terrestrial Wireless Systems for priority frequency bands above 24 GHz.

The existing technical conditions contained in both EC Decision for SRD (EU) 2019/1345 [1] and ERC Recommendation 70-03 [2] allow next generation (5G) wireless broadband electronic communication services to have access to the 66-71 GHz frequency band.

The current regulations have been developed recognising the CEPT Roadmap for 5G [3] with the assumptions that 5G services in this band would operate under the current general authorisation framework and would implement the appropriate technical conditions to co-exist with other usage in the band including current Fixed and mobile Wideband technologies operating under the current regulations.

TABLE OF CONTENTS

0 EXECUTIVE SUMMARY 2

1 INTRODUCTION..... 5

2 CURRENT REGULATIONS AND PREVIOUS RELATED STUDIES 6

3 CONCLUSIONS..... 7

ANNEX 1: CEPT MANDATE 8

ANNEX 2: LIST OF REFERENCES 12

LIST OF ABBREVIATIONS

Abbreviation	Explanation
AR/VR	Augmented Reality/Virtual Reality
CEPT	European Conference of Postal and Telecommunications Administrations
ECC	Electronic Communications Committee
EC	European Commission
ETSI	European Telecommunications Standards Institute
EU	European Union
FS	Fixed Service
MGWS	Multiple Gigabit Wireless Systems
SRD	Short-Range Devices
UHD	Ultra High Definition
WDTS	Wideband Data Transmission Systems

1 INTRODUCTION

ECC has considered Task 3 of the EC mandate to CEPT to develop least restrictive harmonised technical conditions suitable for next-generation (5G) terrestrial wireless systems for priority frequency bands above 24 GHz.

Task 3 is to review and revise, only if necessary, the EU-harmonised technical conditions for use of the 66-71 GHz frequency band with a view to use of this band for next-generation (5G) wireless broadband electronic communications services, taking into account relevant scenarios for shared spectrum use and the further development of all relevant services within the band. In this regard, ensure coherence of results and reporting to the Commission, taking into account the ongoing work on the permanent mandate to CEPT on short-range devices [4], in accordance with the latest Commission guidance [5].

2 CURRENT REGULATIONS AND PREVIOUS RELATED STUDIES

The relevant spectrum regulatory deliverables were revised and updated during the study period for WRC-19 to include both increased power and spectrum availability to allow use of the band 66-71 GHz by a more diverse set of uses and applications. EC Decision for SRD (EU) 2019/1345 [1] and ERC Recommendation 70-03 [2] have provisions to allow Wideband Data Transmission use in the 57-71 GHz band with up to 40 dBm e.i.r.p. and 55 dBm e.i.r.p. (fixed outdoor use).

The studies undertaken were originally to allow higher powers in the 57-66 GHz range and considered the results of new studies in ECC Report 288 [6] as well as previous studies carried out in ECC Reports 113 [7] and 114 [8]. The scope of ECC Report 288 was to analyse the compatibility of Multiple Gigabit Wireless Systems (MGWS) with the Fixed Service (FS) and other services in the 60 GHz band (V-band). It was also to assess the feasibility of establishing a common set of technical conditions under which Fixed Service applications and other envisaged outdoor Wideband Data Transmission use may coexist within the 57-66 GHz range as described in the CEPT Roadmap for 5G [3]. It was considered that this frequency band is a shared band under the assumption that Wideband Data Transmission use includes 5G/IMT.

In addition, the results of the studies carried out within CEPT between wideband data transmission use and the incumbent services and applications in the 57-66 GHz bands were further analysed to include the possibility of expanding the existing regulations to cover the 66-71 GHz band. As a result of this additional analysis both CEPT and EC developed the revised regulations and technology neutral technical conditions contained in both EC Decision for SRD (EU) 2019/1345 and ERC Recommendation 70-03 that were approved last year. The scope of this work was not to look at introducing licenced mobile services into the band as the assumption was that 5G services in the 66-71 GHz band would have to share and meet the same technical requirements as the existing services operating in the band (57-66 GHz) under a general authorisation regime.

ETSI has raised new work items to revise the existing Harmonised Standard for 60 GHz Multiple-Gigabit/s (MGWS) equipment (EN 302 567 [9]) to include the extension from 66-71 GHz and develop two new ETSI harmonised Standards for use of the 57-71 GHz band by Wideband Data Transmission Systems (WDTS) for Fixed Networks (EN 303 722 [10]) and Wideband Data Transmission Systems (WDTS) for Mobile and Fixed Equipment (EN 303 753 [11]). However, although the scope of this work included use of 3GPP technologies it is not specifically targeted at licenced mobile services and the technical parameters being used are based on the current regulations.

CEPT has concluded that the current technical conditions are a fair balance that allows access to the band by a suite of technologies, without disproportionately prioritising one technology over another.

Without networks being able to combine use with other complementary IMT spectrum bands, the existing regulations for 66-71 GHz may not allow some IMT-2020 use cases that can be done in exclusive licensed spectrum.

Some administrations consider that there are some 5G use cases¹ which may be optimal (e.g. quality of service) at higher power than the power defined in ERC Recommendation 70-03 and the EC Decision for SRD (EU) 2019/1345. Such use cases could be considered on a national basis.

CEPT also noted that full 5G use cases can be achieved through the use of several frequency bands including low-bands, mid-bands and high-bands (26 GHz, 42 GHz and 66 GHz).

¹ Those include, but are not limited to, AR/VR, remote healthcare, self-driving vehicles, UHD/4K video (especially uplink direction), etc.

3 CONCLUSIONS

This Report addresses Task 3 of the EC Mandate to CEPT to develop least restrictive harmonised technical conditions suitable for Next-Generation (5G) Terrestrial Wireless Systems for priority frequency bands above 24 GHz.

The existing technical conditions contained in both EC Decision for SRD (EU) 2019/1345 [1] and ERC Recommendation 70-03 [2] allow next generation (5G) wireless broadband electronic communication services to have access to the 66-71 GHz frequency band.

The current regulations have been developed recognising the CEPT Roadmap for 5G [3] with the assumptions that 5G services in this band would operate under the current general authorisation framework and would implement the appropriate technical conditions to co-exist with other usage in the band including current Fixed and mobile Wideband technologies operating under the current regulations.

ANNEX 1: CEPT MANDATE



EUROPEAN COMMISSION
DIRECTORATE-GENERAL FOR COMMUNICATIONS NETWORKS, CONTENT AND
TECHNOLOGY

The Director-General

Brussels
CNECT.B.4

MANDATE TO CEPT

TO DEVELOP LEAST RESTRICTIVE HARMONISED TECHNICAL CONDITIONS SUITABLE FOR NEXT-GENERATION (5G) TERRESTRIAL WIRELESS SYSTEMS FOR PRIORITY FREQUENCY BANDS ABOVE 24 GHz

1. PURPOSE

This Mandate is a follow-up to the Commission mandates regarding the development of harmonised technical conditions suitable for the provision of next-generation (5G) electronic communications services in ‘pioneer’ bands (RSCOM16-40rev3) as well as in EU-harmonised bands (RSCOM18-19rev1). It should deliver least restrictive harmonised technical conditions in the context of technology and service neutrality, including relevant sharing conditions, which allow use of the priority frequency band 40.5-43.5 GHz for terrestrial wireless systems capable of providing wireless broadband electronic communications services. Furthermore, it should assess the need to update the EU-harmonised technical conditions for the same type of use of the priority frequency band 66-71 GHz. The technical conditions for both bands should take into account 5G usage scenarios related to very high-capacity networks and meet the overarching objective of ensuring efficient spectrum use.

2. POLICY CONTEXT AND INPUTS

The ITU-R vision for the next-generation mobile telecommunications² outlines three major 5G usage scenarios – enhanced mobile broadband (eMBB), massive machine type communications (mMTC), and ultra-reliable and low latency communications (URLLC). Millimetre-wave bands are particularly suitable for the provision of high-speed and low-latency services while ensuring high network capacity.

In its 5G Action Plan³, the Commission advanced 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 Opinions on a

² 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

³ See: <https://ec.europa.eu/digital-single-market/en/5g-europe-action-plan>

"Strategic Roadmap towards 5G in Europe"⁴, the RSPG identified the 40.5-43.5 GHz and 66-71 GHz frequency bands as priority bands for the rollout of 5G terrestrial wireless systems in the Union.

The RSPG considered the band 40.5-43.5 GHz as a viable option for 5G in the longer term, taking into account the support from mobile industry and the need to take into account the general balance between the mobile and satellite sectors to access the 40-50 GHz frequency range. The RSPG takes the view that shift of non-5G use from other bands to the 40.5-43.5 GHz band should be avoided as far as possible in order to facilitate its availability for 5G in the future.

Furthermore, the RSPG emphasized that there is no reported use of the 66-71 GHz frequency band. Its proximity to the 57-66 GHz band, already designated and used for multiple-gigabit wireless systems (WiGig), indicates that 5G equipment could potentially be available in the 66-71 GHz frequency band relatively early by benefiting from the ecosystem being developed in the adjacent band, in particular under general authorisation, which remains an important enabler of innovative 5G services and applications. The 66-71 GHz band has better propagation characteristics than the adjacent 57-66 GHz band as it falls outside the so-called oxygen absorption peak, and therefore can be a viable alternative to lower mm-wave bands ensuring comparable cell radiuses in the range of 50-200 metres.

The 66-71 GHz frequency band is currently harmonised in the Union by virtue of the Commission Decision on short range devices⁵ for use with wideband data transmission devices. Any amendment to the EU-harmonised technical conditions applicable to this band, in order to accommodate 5G use, should be implemented unambiguously within a single legal instrument.

The World Radiocommunication Conference in 2019 (WRC-19) amended the ITU-R Radio Regulations by providing a global mobile allocation and IMT (including 5G) identification of both, the 37-43.5 GHz frequency band, or portions thereof (i.e. including the case of using only the 40.5-43.5 GHz band), and the 66-71 GHz frequency band. Therefore, use of the 37-43.5 GHz frequency range would vary across the globe within the concept of a common tuning range. The deployment of 5G services worldwide would benefit from a degree of coherence of the applicable harmonised technical conditions throughout this frequency range on a global scale. For the 40.5-43.5 GHz frequency band, the amended Radio Regulations stipulate measures to ensure co-existence between 5G services and fixed satellite services (space-to-earth) as well as radio astronomy services within the band. The amended Radio Regulations also provide for coexistence of 5G systems and wireless access systems such as multiple-gigabit wireless systems within the 66-71 GHz frequency band. Furthermore, co-existence with certain satellite services should be considered for the latter band.

3. JUSTIFICATION

Pursuant to Article 4(2) of the Radio Spectrum Decision⁶ 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

⁴ Documents RSPG16-032 final (9 November 2016) and RSPG18-005 final (30 January 2018)

⁵ Commission Decision 2006/771/EC as last amended by Commission Decision (EU) 2019/1345.

⁶ 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

policy approaches. Furthermore, they shall take due account of the work of international organisations related to spectrum management such as ITU.

The Commission Communication on the Gigabit Society⁷ sets out even more ambitious Gigabit connectivity targets for households, socio-economic drivers, urban areas and major transport paths, taking account progressing 5G network rollout. The European Electronic Communications Code⁸ refers to the importance of studying the 40.5-43.5 GHz and 66-71 GHz frequency bands for high-capacity 5G networks.

Advances in international standardisation and regulations within 3GPP and ITU, as well as ongoing international deployment of 5G, call for a continued coordination at the EU level in order to deliver 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 40.5-43.5 GHz frequency band and to revise, only if necessary, the harmonised technical conditions in the 66-71 GHz frequency band, with a view to their suitability 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 the 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.

CEPT is requested to collaborate actively with the European Telecommunications Standardisation Institute (ETSI), which develops harmonised standards for conformity under the Radio Equipment Directive⁹. In addition, CEPT should take into consideration emerging technologies and ETSI standards, which define 5G systems, facilitate shared spectrum use and foster economies of scale.

More specifically, CEPT is mandated to perform the following tasks with a view to developing harmonised least restrictive technical conditions for spectrum use:

1. Review the current and planned use of the 40.5-43.5 GHz frequency band and identify relevant scenarios for shared spectrum use between those uses and next-generation (5G) wireless broadband electronic communications services, in order to ensure co-existence and further development of all relevant services within the band.
2. Based on the results under Task 1, develop frequency arrangements and common and minimal (least restrictive) technical conditions¹⁰, including sharing conditions, for the aforementioned frequency band, which are suitable for terrestrial wireless systems, including 5G, in compliance with the principles of technology and service neutrality. In this regard, consider the need to ensure coherence of the harmonised frequency arrangements within the 40.5-43.5 GHz frequency band with the envisaged use of the 37-40.5 GHz frequency range in other world regions.

⁷ COM(2016)587 final

⁸ Directive (EU) 2018/1972.

⁹ Directive 2014/53/EU.

¹⁰ Such as the definition of appropriate Block Edge Masks (BEMs).

3. Review and revise, only if necessary, the EU-harmonised technical conditions for use of the 66-71 GHz frequency band⁵ with a view to use of this band for next-generation (5G) wireless broadband electronic communications services, taking into account relevant scenarios for shared spectrum use and the further development of all relevant services within the band. In this regard, ensure coherence of results and reporting to the Commission, taking into account the ongoing work on the permanent mandate to CEPT on short-range devices¹¹, in accordance with the latest Commission guidance¹².

The conditions under Tasks 2 and 3 should take into account relevant authorisation modes and be sufficient to mitigate interference and to 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.

4. Assess the need for and develop, if necessary, guidance for cross-border coordination.

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

Delivery date	Deliverable	Subject
March 2021	Draft Report(s) from CEPT to the Commission ¹³ .	Description of the work undertaken and the results.
July 2021	Final Report(s) from CEPT to the Commission, 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.

¹¹ Document RSCOM 06-27 Rev (5 July 2006)

¹² Document RSCOM19-9rev2

¹³ Subject to subsequent public consultation

ANNEX 2: LIST OF REFERENCES

- [1] Commission Implementing Decision (EU) 2019/1345 of 2 August 2019 amending Decision 2006/771/EC updating harmonised technical conditions in the area of radio spectrum use for short-range devices
- [2] ERC Recommendation 70-03 relating to the use of Short-Range Devices (SRD), approved October 2020
- [3] CEPT Roadmap for 5G, <https://cept.org/ecc/topics/spectrum-for-wireless-broadband-5g>
- [4] RSCOM06-27rev: "Permanent Mandate to CEPT regarding the annual update of the technical annex of the Commission Decision on the technical harmonization of radio spectrum for use by short-range devices" (5 July 2006)
- [5] RSCOM19-9rev2: "Guidance to CEPT on the eight update of Decision 2006/771/EC (SRD Decision)"
- [6] ECC Report 288: "Conditions for the coexistence between Fixed Service and other envisaged outdoor uses/applications in the 57-66 GHz range", approved January 2019
- [7] ECC Report 113: "Compatibility studies around 63 GHz between Intelligent Transport Systems (ITS) and other systems", approved May 2009
- [8] ECC Report 114: "Compatibility studies between multiple GIGABIT wireless systems in frequency range 57-66 GHz and other services and systems (except its in 63-64 GHz)", approved May 2009
- [9] ETSI EN 302 567: "Multiple-Gigabit/s radio equipment operating in the 60 GHz band; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU"
- [10] ETSI EN 303 722: "Wideband Data Transmission Systems (WDTS) for Fixed Network Radio Equipment operating in the 57-71 GHz band; Harmonised Standard for access to radio spectrum"
- [11] ETSI EN 303 753: "Wideband Data Transmission Systems (WDTS) for Mobile and Fixed Radio Equipment operating in the 57-71 GHz band; Harmonised Standard for access to radio spectrum"