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**COMMISSION IMPLEMENTING DECISION**

of **XXX**

**on the harmonisation of the 40,5-43,5 GHz frequency band for terrestrial systems  
capable of providing wireless broadband electronic communications services in the  
Union**

(Text with EEA relevance)

# COMMISSION IMPLEMENTING DECISION

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**on the harmonisation of the 40,5-43,5 GHz frequency band for terrestrial systems capable of providing wireless broadband electronic communications services in the Union**

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Decision No 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 (Radio Spectrum Decision)<sup>(1)</sup>, and in particular Article 4(3) thereof,

Whereas:

- (1) Directive (EU) 2018/1972 of the European Parliament and of the Council ('European Electronic Communications Code')<sup>(2)</sup> refers to the need for further study of the 40,5-43,5 GHz frequency band in the context of ensuring increased coordinated availabilities of radio spectrum to achieve very high speed fixed and wireless networks. That Directive also requires Member States to promote the harmonisation of use of radio spectrum by electronic communications networks and services across the Union, *inter alia* by pursuing wireless broadband coverage of their national territory and population at high quality and speed, as well as coverage of major national and European transport paths.
- (2) The 40,5-43,5 GHz ('42 GHz') frequency band was harmonised globally for International Mobile Telecommunications<sup>(3)</sup> (IMT) at the 2019 World Radiocommunication Conference (WRC-19) through amending the Radio Regulations of the International Telecommunication Union's Radiocommunication Sector (ITU-R). The relevant amendment to the Radio Regulations stipulates measures to ensure coexistence between IMT systems, including 5G, and Fixed Satellite Service (FSS) as well as the Radio Astronomy Service (RAS) within the 42 GHz frequency band.
- (3) The Commission's Communication 'Connectivity for a Competitive Digital Single Market - Towards a European Gigabit Society'<sup>(4)</sup> sets out ambitious connectivity objectives for the Union, which were updated with the Commission Communication

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(1) OJ L 108, 24.4.2002, p. 1, ELI: [http://data.europa.eu/eli/dec/2002/676\(1\)/oj](http://data.europa.eu/eli/dec/2002/676(1)/oj).

(2) Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code (OJ L 321, 17.12.2018, p.36, ELI: <https://eur-lex.europa.eu/eli/dir/2018/1972/oj>).

(3) In accordance with ITU-R Resolution 243 (WRC-2019) on the Terrestrial component of International Mobile Telecommunications in the frequency bands 37-43,5 GHz and 47.2-48.2 GHz.

(4) Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions 'Connectivity for a Competitive Digital Single Market - Towards a European Gigabit Society' COM(2016) 587 final.

‘2030 Digital Compass: the European way for the Digital Decade’<sup>(5)</sup> and further supported by Decision (EU) 2022/2481 establishing the Digital Decade Policy Programme 2030<sup>(6)</sup>. Those connectivity objectives are to be achieved through the widespread deployment and take-up of very high capacity networks. The Commission’s Communication ‘5G for Europe: An Action Plan’<sup>(7)</sup> identifies coordinated actions at Union level, including the identification and harmonisation of radio spectrum for 5G on the basis of the opinion of the Radio Spectrum Policy Group (RSPG), in order to ensure uninterrupted 5G coverage in all urban areas and major terrestrial transport paths by 2025.

- (4) The RSPG has adopted three opinions on a strategic spectrum roadmap for 5G in Europe<sup>(8)</sup>, in which, *inter alia*, it highlighted the need for implementation of frequency bands above 24 GHz to meet the high capacity performance targets of 5G, and identified the 42 GHz frequency band as a priority in terms of studies for second stage mm-wave 5G bands for terrestrial wireless networks in the Union. The RSPG considered the 42 GHz frequency band as a viable option for 5G in the longer term, taking into account the need for a general balance between the provision of terrestrial mobile and satellite services within the 40-50 GHz frequency range.
- (5) The 42 GHz frequency band provides high capacity allowing for innovative next generation (including 5G) wireless broadband (WBB) electronic communications services (ECS) based on small cells<sup>(9)</sup> and using large block sizes of at least 200 MHz. The use of that frequency band appears suitable, in this context, for hotspots in urban and suburban areas.
- (6) While the 42 GHz frequency band is allocated to the Fixed Service (FS) in the Member States of the Union<sup>(10)</sup> and used for terrestrial fixed wireless connections (‘fixed links’), flexibility of spectrum use is required to ensure coexistence between WBB ECS, including 5G, and fixed links.
- (7) The 42 GHz frequency band is also used for satellite services across the Member States of the Union. That use comprises the 40,5-42,5 GHz frequency range for space-to-Earth communications and the 42,5-43,5 GHz frequency range for Earth-to-space communications, thus supporting receiving and transmitting FSS earth stations, respectively. The adjacent 39,5-40,5 GHz frequency band is allocated to both FSS and Mobile Satellite Service (MSS) for space-to-Earth communications. The latter frequency band is to be used by both coordinated and uncoordinated receiving satellite

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<sup>(5)</sup> Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions ‘2030 Digital Compass: the European way for the Digital Decade’ COM(2021) 118 final.

<sup>(6)</sup> Decision (EU) 2022/2481 of the European Parliament and of the Council of 14 December 2022 establishing the Digital Decade Policy Programme 2030.

<sup>(7)</sup> Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions ‘5G for Europe: An Action Plan’, COM(2016) 588 final.

<sup>(8)</sup> Opinion on spectrum related aspects for next-generation wireless systems (5G) (RSPG16-032 final) of 9 November 2016, Second Opinion on 5G networks (RSPG18-005 final) of 30 January 2018, Third Opinion on 5G implementation challenges (RSPG19-007 final) of 30 January 2019.

<sup>(9)</sup> Such as pursuant to Commission Implementing Regulation (EU) 2020/1070 of 20 July 2020 on specifying the characteristics of small-area wireless access points pursuant to Article 57 paragraph 2 of Directive (EU) 2018/1972 of the European Parliament and the Council establishing the European Electronic Communications Code (OJ L 234, 21.7.2020, p.11, ELI: [https://eur-lex.europa.eu/eli/reg\\_impl/2020/1070/oj](https://eur-lex.europa.eu/eli/reg_impl/2020/1070/oj)).

<sup>(10)</sup> In accordance with the ITU Radio Regulations (2020 edition), the whole 42 GHz frequency band is allocated to the Fixed Service on a co-primary basis in all three Regions of the ITU.

earth stations (both FSS and MSS). Therefore, those satellite earth stations should be appropriately protected against interference from terrestrial WBB ECS.

- (8) The 42,5-43,5 GHz frequency band is further used for systems in the RAS which should be appropriately protected against interference from terrestrial WBB ECS.
- (9) Next-generation terrestrial systems providing WBB ECS, including 5G, should be deployed within the 42 GHz frequency band under harmonised technical conditions in the Union. Those conditions should safeguard the continued operation and potential future development of systems in the relevant incumbent FS, RAS and FSS within this band. Those conditions should equally ensure that such existing and future systems do not have a significant negative impact on the deployment and coverage of next-generation (5G) terrestrial wireless systems.
- (10) Pursuant to Article 4(2) of Decision 676/2002/EC, on 14 April 2020, the Commission issued a mandate to the European Conference of Postal and Telecommunications Administrations (CEPT) to develop least restrictive harmonised technical conditions suitable for next-generation (5G) terrestrial wireless systems for priority frequency bands above 24 GHz, including the 42 GHz frequency band.
- (11) In response to that mandate, on 18 November 2022 the CEPT issued a report<sup>(11)</sup> ('CEPT Report 82') specifying the least restrictive harmonised technical conditions in the 42 GHz frequency band, based on the concept of a Block Edge Mask (BEM), for the introduction of next-generation (5G) terrestrial wireless systems in that band, in compliance with the principles of technology and service neutrality. Those technical conditions are consistent with 5G standardisation developments in particular regarding the channelling arrangements<sup>(12)</sup> and the use of active antenna systems (AAS), and are therefore conducive to global harmonisation.
- (12) The harmonised technical conditions in the CEPT Report 82 assume synchronised operation of neighbouring terrestrial WBB ECS systems of different operators and knowledge of the location of the WBB ECS base stations. Unsynchronised or semi-synchronised operation of neighbouring terrestrial WBB ECS systems requires further studies in order to develop relevant harmonised technical conditions but remains possible with geographical separation and may be subject to additional appropriate mitigation measures applicable at national level.
- (13) The harmonised technical conditions provided in the CEPT Report 82 for the use of the 42 GHz frequency band for terrestrial systems providing WBB ECS are based on the assumption of hotspot deployment and an authorisation regime where the locations of the WBB ECS base stations (transmitters and receivers) are known. Additional measures at national level may be needed for an authorisation regime where the locations of WBB ECS base stations are not known in advance of an installation, in order to ensure appropriate coexistence of those services with other services in this band and in adjacent bands, while still respecting the least restrictive harmonised technical conditions set out in the Annex to this Decision. Such additional measures are provided in Annex 3 to the CEPT Report 82.

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<sup>(11)</sup> Report 82 from the CEPT to the European Commission in response to the Mandate 'to develop least restrictive harmonised technical conditions suitable for next-generation (5G) terrestrial wireless systems for priority frequency bands above 24 GHz', Harmonised least restrictive technical conditions for the 40.5-43.5 GHz frequency band, link: <https://docdb.cept.org/document/28574>.

<sup>(12)</sup> ETSI TS 138 104 (v16.9.0) defines the 39.5-43.5 GHz frequency band for use with New Radio (NR) technology based on time division duplex (TDD), and channel bandwidths of 50 MHz, 100 MHz, 200 MHz and 400 MHz.

- (14) The CEPT Report 82 also provides guidance for the use of the 42 GHz frequency band for terrestrial WBB ECS (including 5G) in order to ensure protection of FS, FSS and RAS within this band, as well as of FS, FSS and MSS in adjacent bands.
- (15) Coexistence between terrestrial systems providing WBB ECS (including 5G) and FSS earth stations operating in the 42 GHz frequency band, and in the adjacent 39,5-40,5 GHz frequency band, can be ensured by applying, where appropriate, technical constraints to the deployment of WBB ECS base stations in a limited geographical area around a satellite earth station. Coexistence measures should be considered between FSS earth stations and WBB ECS base stations where they are near each other, recognising that WBB ECS base stations are expected to be deployed primarily in densely populated areas.
- (16) In line with Directive 2014/53/EU of the European Parliament and of the Council<sup>(13)</sup>, compliance of WBB ECS base stations and terminal stations with the out-of-band emissions' limits below 40,5 GHz and above 43,5 GHz should be based on the assumptions referred to in the CEPT Report 82<sup>(14)</sup>.
- (17) In addition, the CEPT has developed technical guidelines<sup>(15)(16)</sup> to support the introduction of terrestrial systems providing WBB ECS in the 42 GHz frequency band, while allowing in a proportionate way the continued use of FSS receiving and transmitting earth stations in the relevant portions of the 42 GHz frequency band, as well as coexistence with FSS receiving earth stations in the adjacent 39,5-40,5 GHz frequency band. Those technical guidelines can facilitate coexistence in fulfilling the obligations under this Decision.
- (18) Coexistence between terrestrial systems providing WBB ECS (including 5G) and satellite receivers in the FSS within the 42 GHz frequency band is currently feasible, subject to technical conditions that address the antenna elevation of the WBB ECS base stations, noting also the applicable provisions of the Radio Regulations of the ITU-R.
- (19) Coexistence between terrestrial systems providing WBB ECS (including 5G) and fixed links within the 42 GHz frequency band is feasible on a case-by-case basis, subject to coordination at national level between both services, if deployed in the same area and in the same frequency range.
- (20) Specific measures, such as establishing geographical separation distances and exclusion zones, may be required at national level on a case-by-case basis to ensure the protection of stations in the RAS operating in the 42,5-43,5 GHz frequency band.
- (21) Cross-border frequency coordination agreements among Member States as well as between Member States and third countries may be necessary to avoid harmful

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<sup>(13)</sup> Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC (OJ L 153, 22.5.2014, p. 62, ELI: <http://data.europa.eu/eli/dir/2014/53/oj>).

<sup>(14)</sup> For base stations see ETSI TS 138 104 V17.6.0 (table 9.7.4.3.3-2); for terminal stations see ETSI TS 138.101-2 V17.6.0 (table 6.5.2.1-1).

<sup>(15)</sup> ECC Recommendation (22)01 'Guidelines to support the introduction of MFCN in 40.5-43.5 GHz while ensuring, in a proportionate way, the use of FSS receiving earth stations in the frequency band 40.5-42.5 GHz and the use of FSS transmitting earth stations in the frequency band 42.5-43.5 GHz and the possibility for future deployment of these earth stations'.

<sup>(16)</sup> ECC Recommendation (22)02 'Guidelines on measures to facilitate compatibility between MFCN operating in 40.5-43.5 GHz and FSS earth stations receiving in 39.5-40.5 GHz and to prevent and/or resolve interference issues'.

interference and to improve spectrum efficiency and convergence in spectrum use, in compliance with Article 28 of Directive (EU) 2018/1972.

- (22) The need to ensure that citizens are not exposed to electromagnetic fields at a level harmful to public health is imperative. Member States should pursue consistency across the Union to address this issue, having particular regard to the precautionary approach taken in Recommendation 1999/519/EC, in order to work towards ensuring more consistent deployment conditions.
- (23) Member States should take up the 42 GHz frequency band for next-generation terrestrial (5G) wireless broadband electronic communications services based on legally binding harmonised technical conditions in accordance with the CEPT Report 82 and in line with the Union's policy objectives.
- (24) The notion of 'designating and making available' the 42 GHz frequency band in the context of this Decision refers to the following steps: (i) the adaptation of the national legal framework on frequency allocation to include the intended use of this band under the harmonised technical conditions set in this Decision, (ii) the initiation of all necessary measures in order to ensure coexistence with existing use in this band to the extent necessary, (iii) the initiation of the appropriate measures, supported by the launch of a stakeholder consultation process where appropriate, in order to allow the use of this band in accordance with the applicable legal framework at Union level, including the harmonised technical conditions of this Decision. Subsequent to this, Member States should allow the use of the 42 GHz frequency band pursuant to Directive (EU) 2018/1972, in particular, Article 53 thereof.
- (25) Pursuant to Article 4(3) of Decision 676/2002/EC, the Commission should set a deadline to the Member States for the implementation of this Decision. Besides, following the obligation laid down in Article 7 of Decision 676/2002/EC, Member States should provide the Commission with all information necessary for the purpose of verifying the implementation of this Decision. This should apply in particular as regards the gradual introduction and development of terrestrial 5G services in the 42 GHz frequency band and any coexistence issues, to help the timely review and the assessment of its impact at Union level. Such review should also address the suitability of the technical conditions to ensure adequate protection of other services, taking into account the development of terrestrial systems providing WBB ECS, including 5G.
- (26) The measures provided for in this Decision are in accordance with the opinion of the Radio Spectrum Committee,

HAS ADOPTED THIS DECISION:

#### *Article 1*

This Decision establishes the essential harmonised technical conditions for the availability and efficient use of the 40,5-43,5 GHz frequency band in the Union for terrestrial systems capable of providing wireless broadband electronic communications services.

#### *Article 2*

Member States shall designate and make available on a non-exclusive basis the 40,5-43,5 GHz frequency band for terrestrial systems capable of providing wireless broadband electronic communications services, in compliance with the technical conditions set out in the Annex.

### *Article 3*

Member States shall ensure that, in compliance with the technical conditions set out in the Annex, the terrestrial systems referred to in Article 1 protect the following systems appropriately and do not constrain their future evolution and development:

- (a) systems in the Radio Astronomy Service operating within the 42,5-43,5 GHz frequency band;
- (b) satellite systems in the Fixed Satellite Service operating within the 40,5-42,5 GHz frequency band for space-to-Earth communications and within the 42,5-43,5 GHz frequency band for Earth-to-space communications;
- (c) satellite systems in the Fixed Satellite Service and Mobile Satellite Service operating within the 39,5-40,5 GHz frequency band for space-to-Earth communications.

### *Article 4*

Member States shall ensure the coexistence of the terrestrial systems referred to in Article 1 with the continued operation of terrestrial fixed links within the 40,5-43,5 GHz frequency band, based on frequency coordination at national level. Member States may also enable the future evolution and development of terrestrial fixed links within the 40,5-43,5 GHz frequency band at national level.

### *Article 5*

Under the condition that the number and locations of new satellite earth stations are determined so as not to impose disproportionate constraints on the systems referred to in Article 1, and subject to market demand for such stations, Member States shall ensure the continued deployment and operation of existing and new satellite earth stations providing Fixed Satellite Service within the 40,5-43,5 GHz frequency band.

### *Article 6*

Member States shall facilitate cross-border coordination agreements to enable operation of the terrestrial systems referred to in Article 1, taking into account existing regulatory procedures and rights applicable under relevant international agreements.

### *Article 7*

Member States shall implement this Decision by 31 December 2026.

Member States shall provide the Commission with all necessary information on the implementation of this Decision immediately after the adoption of the relevant national measures.

Member States shall monitor the use of the 40,5-43,5 GHz frequency band, including the progress on coexistence between the terrestrial systems referred to in Article 1 and other systems using that band, and report their findings to the Commission upon request or on their own initiative to allow for a timely review of this Decision.

### *Article 8*

This Decision is addressed to the Member States.

Done at Brussels,

*For the Commission*  
*Thierry Breton*

*Member of the Commission*