



NMHH

Nemzeti Média- és Hírközlési Hatóság

Band introduction

The 26 GHz band

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1st Summary

The 26 GHz (24.5-26.5 GHz) frequency band is currently used to operate fixed point-to-point and point-to-multipoint systems. The service providers acquired the entitlement to frequency use in the course of sales process. The expiry times of the rights of frequency use are different for each licensee, with the earliest date being 15.05.2019 (may be extended by 5 years) and 20.04.2027 the latest.

Operators mainly implement backhaul network connections in this frequency band. During previous sales, the 26 GHz proved to be suitable for the purpose of relieving the overcrowded 23 GHz and 38 GHz bands.

At the WRC-15, the identification of frequency bands suitable for the use of 5G systems was determined as item 1.13 in the agenda for the next WRC (WRC-19). In this context, within the range of the specified possible frequency bands (with 26 GHz among them) it is necessary to examine, which frequency bands may be the most suitable for introducing 5G systems. By the end of 2016 an EU mandate was elaborated¹, in which, based on the RSPG's expert opinion on issues related to the 5G spectrum,² CEPT is requested to study the feasibility of a 5G introduction in respect of the bands specified in the document, taking into account the current spectrum uses. In accordance with the opinion of RSPG, the 26 GHz band (24.25-27.5 GHz) has been determined besides the 700 MHz and 3400-3800 MHz bands by the mandate as the band marked for the early adoption of 5G (5G pioneer band).

According to the EU Commission mandate on 5G IMT tests – to be described in detail later – the CEPT is to elaborate the report containing the test results corresponding to the bands determined therein by June 2018.

Concerning the 26 GHz use in Hungary – as early as the preparatory stage – it must be taken into account that there are entitlements to frequency use expiring in 2019, but these may be renewed for a further 5 years without new tender announcement according to the announcement documentation of 2009.

The licensee may request extension of the entitlement by considering the specified deadline (15 November and December 2017). The Authority will determine, latest by February 2018 the consideration to be paid for the extension of the entitlement and the other requirements forming the basis of its decision. Based on the extension request, the Authority must make its final decision latest by 15 August 2018 concerning the entitlement expiring at the earliest date. As the consideration for the extension of the entitlement and the band use conditions must be provided latest by end February 2018 (if the licensee requests extension by mail in November 2017 by the latest date specified for extension applications) in reaction to the extension request, the NMHH will be able to rely in the CEPT report draft prepared in response to the EU Commission's mandate. It is nevertheless certain that there will be no EU legal measure determining obligations available at the time of decision, but the harmonisation processes that have begun will have to be taken into consideration. (The detailed conditions of extension can be found in Section 3.3.)

If the regulation of the 26 GHz band is amended to allow introduction of the 5G systems, the international regulators must also determine new channel arrangements and band use conditions (e.g. BEM³), which will be advisable for us to apply as well, following band rearrangement, and it will even be obligatory for the EU's harmonised rules. Additionally, a new international frequency co-ordination recommendation will be required and, on this basis, new frequency coordination agreements between

¹ <https://ec.europa.eu/digital-single-market/en/news/radio-spectrum-cept-mandates-0>

² http://rspg-spectrum.eu/wp-content/uploads/2013/05/RPSG16-032-Opinion_5G.pdf

³ Limit values for out-of-block emissions (block edge mask)

administrations will need to be concluded with neighboring countries. Since almost the entire band is in use in Hungary and the majority of the entitlements will not be expiring in the near future, the management of the current use requires preliminary decision, if the band should be made available for 5G IMT systems before the expiry of these entitlements. The announcement documentation included in 2009 as well as in 2012 that exclusively in highly justifiable cases, the NMHH is entitled to amend the decision on entitlement to frequency use in the interest of efficient bandwidth usage, in view of its international obligations and those resulting from Hungary's EU membership.

Therefore it is now possible to conclude, that the 26 GHz frequency band will serve the implementation of the next generation (5G) mobile networks; however, as to the detailed harmonised technical future of this band (channel allocation, BEM definition) nothing certain is known that could be reflected in the national legislation. As soon as the ongoing international (ITU and CEPT) investigations are completed, in knowledge of the results and the WRC-19 decisions, it will be possible to develop a concrete set of rules at national level, which, however – according to the current plans – will be preceded by an EU decision. The process of harmonisation that has begun upon the mandate of the EU Commission and the published schedule of the CEPT's 5G tasks provides adequate grounds to anticipate the expected amendment.

2nd Introduction

The 26 GHz (24.5-26.5 GHz) frequency band is currently used to operate fixed point-to-point and point-to-multipoint systems. The licensees obtained their entitlements to frequency use in the course of 2 tender procedures (conducted in 2008/2009⁴ and 2011/2012⁵). The dates of expiry of the rights of frequency use differ significantly due to the 2 processes, moreover, they vary even in the case of individual licensees within the same procedure, the earliest being 15.05.2019, and the latest is 20.04.2027.

Operators mainly implement backhaul network connections in this frequency band. During previous sales, the 26 GHz proved to be suitable for the purpose of relieving the overcrowded 23 GHz and 38 GHz bands.

At the WRC-15 the identification of potential frequency bands for the use of 5G systems was determined as item 1.13 in the agenda for the next WRC (WRC-19). In this context, within the range of the specified possible frequency bands (with 26 GHz among them) provided in Resolution 238 of the WRC-15, it is necessary to examine in the 2015-2016 examination period, which may be the most suitable for introducing 5G systems. The EU mandate,⁶ based on the opinion issued by RSPG⁷ regarding the matters of the 5G spectrum, was issued on 7 December 2016⁸, in which the CEPT has been requested to study the feasibility of introducing 5G concerning the bands specified in the document, taking the current applications into consideration. Besides the 700 MHz and 3400-3800 MHz bands, the 26 GHz band (24.25-27.5 GHz) has been denoted by the mandate as the band marked for the early adoption of 5G (5G pioneer band), in coherence with the opinion of the RSPG. Several countries have reported that there is a significant fixed use in this band, in spite of which studies have already begun in the CEPT⁹ ECC PT1 group, where several correspondence groups were set up for this topic. At CEPT level, the compatibility tests with fixed systems are conducted by the SE 19 group. Among the frequency bands above 24 GHz, the larger countries within Regions 2 and 3 (e.g. South Korea, Japan, USA) consider the 28 GHz band as one of the most suitable, although the EU does not support the use of this band by 5G systems considering the protection of the satellite systems.

The CEPT mandate identifies the 32 GHz and 42 GHz bands, of all the bands above 6 GHz, as likely to be suitable for 5G purposes, which needs to be investigated, although these are not pioneer bands, that is, their utilisation depends on a WRC-19 decision. These would be more suitable for us and several other countries for the use of 5G, since these bands are unutilised or may be cleared by simpler legal procedures and at lower risks. We have expressed this standpoint on more than one occasions until the compromise decision of RSPG.

Based on the EU Commission's decision, they must also specify a new channel layout and new bandwidth conditions (e.g. BEM) in the 26 GHz band, which we are expected to apply as well, after a transitional period, following a band conversion. Additionally, a new international frequency co-

⁴ The Authority announced a call for proposals on 22 October 2008 in the subject of entitlement to frequency use concerning microwave radio transmission systems (26 GHz), which was deemed successful on 30 April 2009.

⁵ The Authority launched a tendering procedure in the framework of an official procedure, by publishing an announcement on 7 November 2011 concerning the entitlement to frequency use of the basic block of the 26 GHz frequency band, which was deemed successful in February 2012 by a resolution.

⁶ RSPG: Radio Spectrum Policy Group – Pursuant to 2002/622/EC Commission Decision of 26 July 2002 establishing a Radio Spectrum Policy Group (RSPG), the RSPG acts as an advisor in European strategic issues on radio spectrum.

⁷ http://rspg-spectrum.eu/wp-content/uploads/2013/05/RPSG16-032-Opinion_5G.pdf

⁸ <https://ec.europa.eu/digital-single-market/en/news/radio-spectrum-cept-mandates-0> - Mandate to CEPT to develop harmonised technical conditions for spectrum use in support of the introduction of next-generation (5G) terrestrial wireless systems in the Union

⁹ Conférence européenne des Administrations des postes et des télécommunications – European Conference of Postal and Telecommunications Administrations

ordination recommendation will be required and, on this basis, new frequency coordination agreements will need to be concluded with neighboring countries.

Therefore, currently nothing certain is known of the detailed future technical rules concerning the use of the band that could be reflected in the national regulation, but, in view of the harmonisation process started, a new EU decision is expected in the first half of 2019 on making the band usable for the new generation mobile systems (referred to as 5G usage today). As soon as the ongoing international (ITU and CEPT) investigations are completed, in knowledge of the results, it will be possible to develop a concrete set of rules at national level.

3rd Current use

3rd1st International regulation

The basis of the international regulation for the present use is provided by the Radio Regulations, which does not provide as yet for mobile service allocation. We will therefore introduce the international rules with focus on the use in Hungary.

3rd1st1st ITU

In the following, the allocation table according to the RR¹⁰ is shown concerning the 24.25-27.5 GHz band, based on Annex 1. of NMHH Decree 7/2015 (XI.13.) on the national frequency allocation and the rules of using frequency bands (hereinafter: NFFF).

	A	B	C	D
1	ALLOCATION TABLE FOR RR FREQUENCY BANDS			ALLOCATION VALID FOR HUNGARY ACCORDING TO RR
2	REGION 1	REGION 2	REGION 3	
3	24.25–24.45 GHz FIXED	24.25–24.45 GHz RADIO NAVIGATION	24.25–24.45 GHz RADIO NAVIGATION FIXED MOBILE	24.25–24.45 GHz FIXED
4	24.45–24.65 GHz FIXED INTRA-SATELLITE	24.45–24.65 GHz INTRA-SATELLITE RADIO NAVIGATION 5.533	24.45–24.65 GHz FIXED INTRA-SATELLITE MOBILE RADIO NAVIGATION 5.533	24.45–24.65 GHz FIXED INTRA-SATELLITE
5	24.65–24.75 GHz FIXED SATELLITE FIXED (Earth–space direction) 5.532B INTRA-SATELLITE	24.65–24.75 GHz INTRA-SATELLITE SATELLITE RADIOLOCATING (Earth–space direction)	24.65–24.75 GHz FIXED SATELLITE FIXED (Earth–space direction) 5.532B INTRA-SATELLITE MOBILE 5.533	24.65–24.75 GHz FIXED SATELLITE FIXED (Earth–space direction) 5.532B INTRA-SATELLITE
6	24.75–25.25 GHz FIXED SATELLITE FIXED (Earth–space direction) 5.532B	24.75–25.25 GHz SATELLITE FIXED (Earth–space direction) 5.535	24.75–25.25 GHz FIXED SATELLITE FIXED (Earth–space direction) 5.535 MOBILE	24.75–25.25 GHz FIXED SATELLITE FIXED (Earth–space direction) 5.532B
7	25.25–25.5 GHz	FIXED INTRA-SATELLITE 5.536 MOBILE Satellite authentic frequency and clock signal (Earth–space direction)		25.25–25.5 GHz FIXED INTRA-SATELLITE 5.536 MOBILE Satellite authentic frequency and clock signal (Earth–space direction)
8	25.5–27 GHz	SATELLITE EARTH RESEARCH (Space–Earth direction) 5.536B FIXED INTRA-SATELLITE 5.536 MOBILE SPACE RESEARCH (Space–Earth direction) 5.536C Satellite authentic frequency and clock signal (Earth–space direction) 5.536A		25.5–27 GHz SATELLITE EARTH RESEARCH (Space–Earth direction) 5.536B FIXED INTRA-SATELLITE 5.536 MOBILE SPACE RESEARCH (Space–Earth direction) Satellite authentic frequency and clock signal (Earth–space direction) 5.536A

¹⁰ RR: Radio Regulation, the ITU Radio Regulations, a document referred to as the international radio regulations

	A	B	C	D
1	ALLOCATION TABLE FOR RR FREQUENCY BANDS			ALLOCATION VALID FOR HUNGARY ACCORDING TO RR
2	REGION 1	REGION 2	REGION 3	
9	27–27.5 GHz FIXED INTRA-SATELLITE 5.536 MOBILE	27–27.5 GHz FIXED SATELLITE FIXED (Earth–space direction) INTRA-SATELLITE 5.536 5.537 MOBILE		27–27.5 GHz FIXED INTRA-SATELLITE 5.536 MOBILE

3rd1st2nd CEPT

Concerning the primarily fixed applications used exclusively in the 24.5-26.5 GHz band, the regulatory framework is provided by the following CEPT documents, based on which the national frequency management requirements were elaborated.

At CEPT level, *Recommendation CEPT T/R 13-02* regulates the channel arrangement for digital fixed point-to-point systems for the band.

Recommendation ECC/REC/(11)01 provides guidance for fixed wireless systems for allocating the frequency block. This regulatory document states that

- the size of the basic block is 28 MHz,
- based on this, multiples of 28 MHz may be the designated frequency block sizes,
- how big the protective range must be between the designated frequency blocks (for FDD and TDD as well), and
- how can the frequency blocks be used for the various polarisations.

ERC report 099 formed the basis of the requirements laid down in *Recommendation ECC/REC/(11)01*.

3rd1st3rd EU

There are two regulatory documents concerning vehicle radars in the EU regulation, which indirectly influences the current use. These two documents are the Commission Decision *2005/50/EC* and Commission Implementing Decision *2011/485/EU* amending it, concerning the temporally limited use of low-range vehicle radars used in the 24 GHz frequency band.

These two decisions may be interesting due to the rules detailed in Chapter 6.

3rd2nd National regulation

3rd2nd1st Based on NFFF Annex 2.

The particular applications may be used in the 24.25-27.5 GHz frequency band according to the table below.

24.25–24.5 GHz					
FIXED		P	1	K	24 GHz band radio and television news and radio and television programme transmission systems
MOBILE	RRE	P	1	K	Wireless cameras
		PN	3	K	SRD: TTT applications
		PN	3	K	SRD: radio determination applications
24.5–25.25 GHz					
FIXED		P	1	K	26 GHz band fixed digital point-to-point systems
			1	K	26 GHz band digital point-to-multipoint systems
			1	K	FWA
SATELLITE FIXED (Earth–space direction) (24.65–25.25 GHz)	5.532B	E			
		PN	3	K	SRD: TTT applications
		PN	3	K	SRD: radio determination applications
25.25–25.5 GHz					
FIXED		P	1	K	26 GHz band fixed digital point-to-point systems
			1	K	26 GHz band digital point-to-multipoint systems
			1	K	FWA
Satellite authentic frequency and clock signal (Earth–space direction)		P	2	K	Satellite authentic frequency and clock signal applications
		PN	3	K	SRD: TTT applications
		PN	3	K	SRD: radio determination applications
25.5–26.5 GHz					
Satellite earth research (Earth–space direction)	5.536A 5.536B	P	1	K	Satellite Earth research applications
FIXED		P	1	K	26 GHz band fixed digital point-to-point systems
			1	K	26 GHz band digital point-to-multipoint systems
			1	K	FWA
SPACE RESEARCH (space–Earth direction)	5.536A	P	1	T	Space research systems

Satellite authentic frequency and clock signal (Earth-space direction)		P	2	K	Satellite authentic frequency and clock signal applications
		PN	3	K	SRD: TTT applications
		PN	3	K	SRD: radio determination applications
26.5–27 GHz					
Satellite earth research (Earth-space direction)	5.536A 5.536B	P	1	K	Satellite Earth research applications
FIXED	N2	N	1	K	Digital point-to-point systems
			1	K	Military fixed systems
MOBILE	N2	N	1	K	One and dual frequency systems
			1	K	Military mobile systems
SPACE RESEARCH (space-Earth direction)	5.536A	P	1	T	Space research systems
Satellite authentic frequency and clock signal (Earth-space direction)		P	2	K	Satellite authentic frequency and clock signal applications
		PN	3	K	SRD: TTT applications in the 26.5–26.65 GHz band
		PN	3	K	SRD: radio determination applications
27–27.5 GHz					
FIXED	N2	N	1	K	Digital point-to-point systems
			1	K	Military fixed systems
MOBILE	N2	N	1	K	One and dual frequency systems
			1	K	Military mobile systems

Regarding the main applications, it can be seen that civilian fixed applications are dominant in the 24.25-26.5 GHz band, and non-civilian mobile and fixed applications are dominant in the 26.5-27.5 GHz band. According to the public NJFA¹¹ (2014) the 25.25-27.5 GHz range is available for aerial, terrestrial and maritime systems, while the 26.5-27.5 GHz range is available for land-based military systems. In addition to this, the non-civilian (but non-military) single and dual frequency mobile and digital point-to-point systems may also operate. Currently there is no valid radio license within the 26.5-27.5 GHz band.

3rd2nd2nd Based on NFFF Annex 3.

The band use conditions and frequency management requirements of the 26 GHz band fixed digital point-to-point and digital point-to-multipoint systems are shown below, based on the effective NFFF regulation.

Sub-bands of the 24.5-26.5 GHz band:

- 24 500–24 549 MHz: lower guard band
- 24 549–25 445 MHz: lower block band
- 25 445–25 557 MHz: middle guard band
- 25 557–26 453 MHz: upper block band
- 26 453–26 500 MHz: upper guard band

Guard bands are not allocable.

The lower and the upper block band are divided into 32 28 MHz basic blocks, with the duplex distance being 1008 MHz in case of an FDD system, but the use of the TDD system is also possible in the blocks. User blocks may be formed by consolidating the basic blocks. The user blocks are separated by the 28 MHz guard band.

Electronic communication services may be provided in the frequency band, and the band may be used for electronic communications operative purposes. Entitlement to frequency use may be acquired through tendering procedures and is of nationwide coverage, the mode of frequency management is block allocation. The volume of frequency that can be acquired is limited; one service provider may acquire entitlement to frequency use for a maximum of six basic blocks. Secondary trading is allowed; the entitlement to frequency use and the right of frequency use may be transferred and leased either partially or entirely; partial transfer or lease relating to frequencies shall be completed in form of blocks. The duration of the right of frequency use is a minimum of 9 and a maximum of 20 years, with the actual duration determined by the announcement documentation of the tendering procedure and the resolution concluding it, or a public contract.

For the commissioning of central stations and repeater stations of point-to-multipoint TDD systems, the approval of the adjacent user block's licensee is also required, if within a 500 m radius of this central station or repeater station there are existing central stations or repeater stations operating in the adjacent user block. The newly installed TDD station cannot request protection against the interference effects of an existing central station or repeater station operating in an adjacent frequency block and installed within a radius of 500 m from the foreseen installation site [ECC/REC/(11)01, Rec. 6.].

For the commissioning of central stations and repeater stations of point-to-multipoint systems, the approval of the adjacent user block's licensee is also required, if within a 500 m radius of this central station or repeater station there are existing TDD central stations or repeater stations operating in the adjacent user block. The newly installed station cannot request protection against the interference

¹¹ NATO Joint Civil/Military Frequency Agreement

effects of an existing TDD central station or repeater station operating in an adjacent user block and installed within a radius of 500 m from the foreseen installation site [ECC/REC/(11)01, Rec. 6.].

In the 26 GHz band, for the lower block bands of point-to-multipoint systems, the signal paths of central station → user station, central station → repeater station and repeater station → user station may be used, while reverses of these may be used for the upper block bands.

The detailed rules on the maximum power values used by the stations and interference of adjacent blocks between two station can be found in the corresponding section of Annex 3 of the NFFF.

3rd3rd Actual use

3rd3rd1st Current allocation of the 24.5-26.5 GHz frequency band:

COMPANY NAME	BASIC BLOCK	LOWER SUB-BAND	UPPER SUB-BAND	DATE OF EXPIRY
FREE	Basic block 1			
FREE	Basic block 2			
FREE	Basic block 3			
Magyar Telekom Nyrt.	Basic block 4	24633-24661	25641-25669	05.04.2027
	Basic block 5	24661-24689	25669-25697	
GUARD BAND	Basic block 6	24689-24717	25697-25725	
Telenor Magyarország Zrt.	Basic block 7	24717-24745	25725-25753	05.04.2027
	Basic block 8	24745-24773	25753-25781	
	Basic block 9	24773-24801	25781-25809	
	Basic block 10	24801-24829	25809-25837	
GUARD BAND	Basic block 11	24829-24857	25837-25865	
Antenna Hungária Zrt.	Basic block 12	24857-24885	25865-25893	15.06.2019*
	Basic block 13	24885-24913	25893-25921	
	Basic block 14	24913-24941	25921-25949	05.04.2027
	Basic block 15	24941-24969	25949-25977	
	Basic block 16	24969-24997	25977-26005	
	Basic block 17	24997-25025	26005-26033	
GUARD BAND	Basic block 18	25025-25053	26033-26061	
Vodafone Magyarország Zrt.	Basic block 19	25053-25081	26061-26089	05.04.2027
	Basic block 20	25081-25109	26089-26117	
	Basic block 21	25109-25137	26117-26145	
	Basic block 22	25137-26165	26145-26173	
	Basic block 23	25165-25193	26173-26201	
	Basic block 24	25193-25221	26201-26229	
GUARD BAND	Basic block 25	25221-25249	26229-26257	
	Basic block 26	25249-25277	26257-26285	05.04.2027
	Basic block 27	25277-25305	26285-26313	

Magyar Telekom Nyrt.	Basic block 28	25305-25333	26313-26341	15.05.2019*
	Basic block 29	25333-25361	26341-26369	
GUARD BAND	Basic block 30	25361-25389	26369-26397	
Digi Kft.	Basic block 31	25389-25417	26397-26425	05.04.2027
	Basic block 32	25417-25445	26425-26453	

*with a 5 year extension option

3rd3rd2nd Conditions of extension and amendment of the entitlement to frequency use

It can be seen that there are entitlements to frequency use expiring in **2019**, but these **may be renewed for a further 5 years** without new tender announcement according to the announcement documentation of 2009.

(a) If the licensee wishes to extend the duration of the licence, it is obliged to submit an application at the Authority 18 (eighteen) months before expiry of the licensee, requesting the said extension. The Authority shall communicate the recommended amount in advance of all fees payable for the entitlement to frequency use over the duration of extension, and all other requirements forming the basis of its decision within 3 (three) months from the reception of the request. The enterprise possessing entitlement to frequency use is obliged to declare within 3 (three) months from the communication of the Authority's reply on whether it accepts the conditions of extending the duration. If the enterprise possessing entitlement to frequency use does not accept the amount of the fee indicated by the Authority, it is entitled to propose a counterbid to the said fee in a declaration. The declaration must furthermore contain all data the Authority indicated as the basis of its decision. If the enterprise makes no such declaration until expiry of the above deadline, it is to be understood as the said enterprise's resignation from extending the duration of the entitlement.

(b) The Authority is obliged take the decision regarding the extension of the license by not later than 9 (nine) months prior to the date of expiry of the license period. The Authority shall consider the following for the decision made on extending the duration of the entitlement:

(i) that the quality of the service provided by the licensee until the day before submitting the application, the coverage achieved and the other parameters of service have met the requirements set out in the present documentation, the Authority's resolution and the corresponding legal regulations,

(ii) the changes on the mobile telecommunications market after the decision on entitlement to frequency use becoming effective (including the technology applied) and the capability of the licensee to use these, and

(iii) the international obligations of the Republic of Hungary and the Authority after the effective date of the decision on the entitlement to frequency use, and – if applicable – the capability of the licensee to adhere to these new obligations, and

(iv) whether the licensee undertook payment of the new recommended fee in its recommendation.

- (c) The enterprise entitled to frequency use may not reclaim or request the reduction of the fee paid for the entitlement to frequency use, if the duration of the entitlement is not extended.

Therefore, it can be seen from the above that both Antenna Hungária and Magyar Telekom may request an extension of their usage rights, taking into account the specified deadline (Magyar Telekom until 15 November 2017 and Antenna Hungária until 15 December 2017), and the Authority is obliged to make a decision by not later than 15 September 2018, deliberating the contents of point (b) of Section 3.3.2.

Both sales documentation packages as well as the decisions based on them contain rules, pursuant to which the NMHH is entitled to amend the resolution regarding the entitlement to frequency use. Such amendment may even affect the band limits of the frequency bands constituting the object of the entitlement to frequency use as well as the size and layout of the blocks in the frequency bands. The NMHH has the right to review the terms of the band use and to partially revoke or amend the entitlement to frequency use. In case of amendment, NMHH must take into consideration a number of regulations, especially Article 84(8) of Act C of 2003 on Electronic Communications (hereinafter: Electronic Communications Act)¹². The NMHH is, of course, obliged to inform the parties concerned in due time, in advance. (Section 40 of the Electronic Communications Act regulates the rules of reconciliation with the interested parties.) Such an amendment may not seriously prejudice the licensees' interests, and is only possible in particularly justified cases, in order to ensure efficient bandwidth usage, based on the following reasons:

1. a situation has emerged on the Hungarian electronic telecommunications market that impedes broader access affecting a large consumer segment and fostering the development of information society, the appearance and development of technologies or services allowing greater choice and/or more accessible and higher standard opportunities at a competitive price, that cannot be resolved among rational conditions without applying the above measures;
2. with regard to provisions related to spectrum regulation stemming from international obligations applicable pursuant to Hungarian law; or
3. with regard to primary or secondary sources of European Union law governing the implemented spectrum regulation.

Although, at the time of renewal, the specific content of the new EU obligation will not yet be known, the ongoing harmonisation process must certainly be brought to the attention of the parties concerned, in the course of determining the conditions of renewal.

¹² According to Article 84(8) of the Electronic Communications Act, if a right of frequency use is revoked due to an amendment of a statutory regulation, particularly an international commitment promulgated by law, then the licensee is entitled to compensation.

4th Future use

Currently global harmonisation is uncertain, but the European Union has obliged to make the 26 GHz band suitable for 5G as soon as possible. The bands are being examined at international organisations (ITU, CEPT and the other regional organisations), but the opinions are contradictory concerning the 26 GHz band even on a global scale, as the USA, Japan and South Korea support the 28 GHz, which was however rejected by the EU. The GSMA supports the use of the 26 GHz band for 5G, but the problem is that passive satellite services operate in the lower adjacent band (24 GHz), which can only function appropriately, if no transmission from adjacent bands takes place¹³. According to certain forecasts, however, a 5G system operating in the 26 GHz band would have an out of band radiation of such extent that would be detrimental to the functioning passive services operating in the adjacent bands. The investigations also cover this question of compatibility.

4th1st International regulation

4th1st1st ITU

A decision was made at WRC-15 that the agenda items of WRC-19 should include the examination of the identification of higher frequency bands for IMT systems (WRC-19 1.13. agenda item). In connection with this, the frequency bands to be examined in the preparatory period of the WRC-19 were determined.

The IMT examinations are ongoing in the ITU-R WP 5D group, since the 24.25-27.5 GHz band is also present in the WRC-15 decision¹⁴, that provides the frequency bands which must be examined in connection with the possible introduction of the 5G systems.

4th1st2nd CEPT

Based on the EU Commission's mandate¹⁵ the examination of the band is currently underway in CEPT. More precisely, the ECC PT1 workgroup is dealing with what conditions would be necessary to operate 5G systems in the band. Especially the conditions of how the 5G systems are compatible with the currently operating applications of different types. According to the EU mandate, the CEPT report draft will have to be prepared by March 2018, and the final report by June 2018.

Firstly the compatibility with the various satellite systems was examined – this does not concern Hungary significantly. For us, the examination of compatibility with fixed systems will be more interesting, as a high number of backhaul network connections operate in the band at present. Within CEPT, the compatibility tests with fixed systems are conducted by the SE 19 group.

4th1st3rd EU

¹³ <https://www.policytracker.com/headlines/800-mobile-operators-support-26-ghz-for-wrc-19-harmonisation>

¹⁴ RR Resolution 238 (WRC-15)

¹⁵ <https://ec.europa.eu/digital-single-market/en/news/radio-spectrum-cept-mandates-0> - Mandate to CEPT to develop harmonised technical conditions for spectrum use in support of the introduction of next-generation (5G) terrestrial wireless systems in the Union

The EU Commission mandate, based on the most important currently existing document in the subject, i.e. the expert's statement issued on the questions of the RSPG 5G spectrum¹⁶, in which the EU requests the CEPT to examine the potential 5G bands.

This document determines the following key tasks and deadlines for the CEPT¹⁷:

1. Review of the technical conditions for the 3.4-3.8 GHz frequency band (5G pioneer band) for the applicability of 5G terrestrial wireless systems
2. Study of the 26 GHz (24.25-27.5 GHz) frequency band (5G pioneer band) on the compatibility of the 5G systems and the systems currently in use
3. Elaboration of new channel arrangement and band use conditions for the 26 GHz band concerning 5G systems (by considering the protection of the currently operating systems)
4. Elaboration of band use conditions concerning cross-border coordination

Deadline	Resulting document	Subject:
March 2018	"A" report draft	Description of the results of the test determined in task 1
June 2018	Final "A" report, incorporating the observations submitted during the public consultation	Description of the results of the test determined in task 1
March 2018	"B" report draft	Description of the results of the test determined in tasks 2 and 3
June 2018	Final "B" report, incorporating the observations submitted during the public consultation	Description of the results of the test determined in tasks 2 and 3

The results of the task determined in Section 4 must be incorporated in the report concerning the corresponding band.

The EU Commission as well as the member states wish to see the introduction of 5G as early as possible; the 3400-3800 MHz band and the 26 GHz band (24.24-27.5 GHz) from the range above 6 GHz have been primarily designated for this. ECC PT1, the CEPT workgroup responsible for the mobile services, has already started examining this matter. The most difficult part of the examination will be determining the rules to ensure protection of the existing services.

Test equipment exist in the 4.5 GHz, 15 GHz, 26 GHz and 28 GHz bands, since 5G tests have been performed in the United Kingdom, France, South Korea and Japan and the USA also supports the use of the 28 GHz band, but it remains to be seen whether the production of the equipment is possible in a cost effective way with a wide tuning range that would cover both the 26 GHz and the 28 GHz bands.

4th2nd National regulatory plans

¹⁶ http://rspg-spectrum.eu/wp-content/uploads/2013/05/RPSG16-032-Opinion_5G.pdf

¹⁷ <https://ec.europa.eu/digital-single-market/en/news/radio-spectrum-cept-mandates-0> - Mandate to CEPT to develop harmonised technical conditions for spectrum use in support of the introduction of next-generation (5G) terrestrial wireless systems in the Union

Elaboration of the national regulation may begin when the results of the international examination will be available. The following can be said concerning the compatibility of future and the present use. The 24.5-26.5 GHz band is currently used to operate fixed point-to-point and point-to-multipoint systems (the user blocks have been acquired by the service providers through a sales process) and entitlements to frequency use are granted until the expiry date, although they may be significantly amended due to the EU obligation required by the amendment rules.

We have no knowledge as yet, of how and when the 5G systems will be possible to be introduced in the band, because this depends on the compatibility studies; it is, however, foreseeable that the introduction of the 5G system will not be easy under the current intensive use, so it is likely that a band conversion will be required as soon as it is decided that the 26 GHz band must be made available for terrestrial wireless 5G systems. Such a decision will also need to discuss the transition period, the transitional conditions and the rules of appropriate timing. This must be taken into account for the preparation of the EU decision. Alternatives may have to be elaborated before the decision is made. During the negotiations, we must propose steps necessary for the protection of the current use in a way that is in keeping with the interests related to the introduction of 5G. Given the different member state uses, a transitional period is expected to be determined. The possible transitional period can only be determined after the channel allocation and guard band generation rules for the future use of 26 GHz, as well as the method of access have been determined at international level.

In defining the technical rules for bandwidth use, demands for wide channels may arise in the case of 5G, which was not a key issue when the existing 28 MHz channel spacing was determined. During the international negotiations, the Hungarian position should be formulated so as to minimise the need for transformation and to ensure that the band is mathematically reorganised, by including any unused sub-bands and guard bands, causing the least possible harm to the interests of the current licensees.

5th Frequency use and coordination beyond the borders

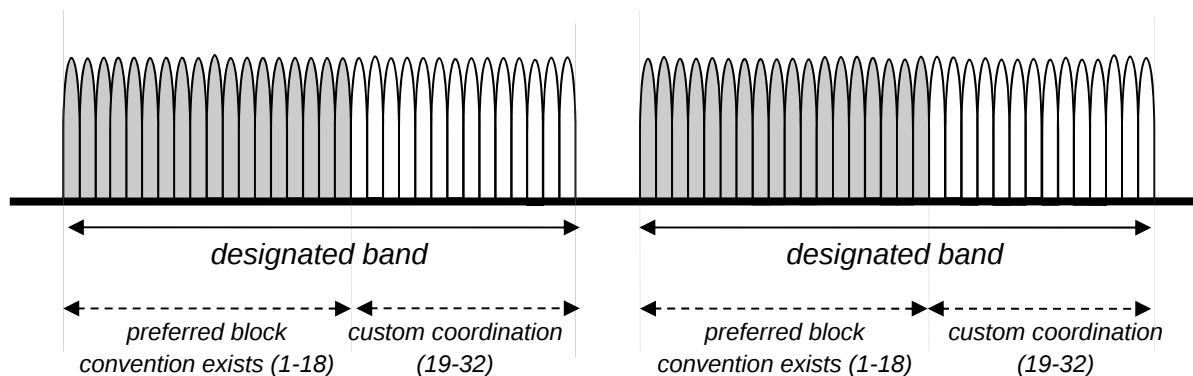
5th1st Coordination status

Concerning basic blocks No. 1-18, Hungary (HNG) has signed international coordination agreements (preferred block agreement) with the neighbouring countries.

1			SVK	AUT	SVN	HRV	SRB	ROU	UKR
2	24.549–25.053 GHz	Vienna (2000)	x	x	x				
3	25.557–26.061 GHz	Bratislava (2002)	x						x
4		Budapest (2005)			x	x		x	x
5		Budapest (2006)				x	x	x	
6		Bratislava (2002) (amended in 2006)							x

The agreements specify whether Hungary or a neighbouring country has preferences concerning basic blocks No. 1-18.

The usage of this block range near the country borders is limited by the preferred block agreement. Currently, there are no such restrictions for basic blocks No. 19-32. If a coordination agreement is reached for basic blocks No. 19-32 or any part of them in the future, the preferred block restrictions will become effective in this range. However, there are no plans at present for such an extension of the agreement.



1 1: The preferred block convention in the 26 GHz frequency band

Usage of basic blocks 1-18 near the country borders is regulated by a preferred block agreement. The agreement is valid for FDD stations. For FDD transmissions, “pr” indicates preference, and “–” indicates dispreference. Where Hungary has preference, the neighbouring country has dispreference. Where Hungary has dispreference, the neighbouring country has preference.

The power of transmissions across national borders is regulated by the international coordination agreement as follows:

- a) For point-to-point connections:

In the case of an existing preference, the transmission across the national border must be such that the maximum value of the power density measured in the neighbouring country at a distance of 25 km from the national border shall not exceed $-115 \text{ dB(W/(m}^2\cdot\text{MHz))}$;

In the case of an existing dispreference, the maximum value of the surface power density measured at the national border cannot exceed $-115 \text{ dB(W/(m}^2\cdot\text{MHz))}$.

b) For point-to-multipoint systems:

In the case of an existing preference, the transmission across the national border must be such that the maximum value of the power density measured in the neighbouring country at a distance of 15 km from the national border shall not exceed $-105 \text{ dB(W/(m}^2\cdot\text{MHz))}$;

In the case of an existing dispreference, the maximum value of the surface power density measured at the national border cannot exceed $-105 \text{ dB(W/(m}^2\cdot\text{MHz))}$.

The calculation of field strength must be based on outdoor wave propagation and assuming an atmospheric attenuation of 0.21 dB/km, as specified in the ITU-R P.452-12 Recommendation.

The international preferred block agreement does not apply to TDD type transmissions. TDD stations are of tertiary operation: They cannot cause interference in foreign FDD stations, and they must tolerate interferences caused by foreign FDD stations.

The preferred block agreement does not regulate basic blocks No. 19 – 26 (out of the blocks to be allocated by the present tender). The two frequency bands (25053-25277 MHz / 26061-26285 MHz) defined by basic blocks No. 19-26 are regulated by the general coordination policies of the International Telecommunication Union (ITU). Near national borders, priority is given to stations registered earlier at ITU's radio communications office in Geneva. In the case of and interference, the operator of the station registered at a later date in ITU's offices (or not registered at all)

a) is obliged to remedy the interference issues, and

b) must tolerate any interference caused.

Concerning the power conditions of basic blocks No. 19 – 26, domestic limits apply for FDD transmissions, and there are no restrictions limiting the strength of transmissions across national borders.

TDD stations in basic blocks No. 19-26 have a tertiary status, therefore they cannot cause interference in foreign FDD stations, and they must tolerate interferences caused by foreign FDD stations.

The following table shows the preferred allocation for the various border zones.

Basic block	Frequency band [MHz]	AUT	AUT SVK	SVK	SVK UKR	UKR	UKR ROU	ROU	ROU SRB	SRB	SRB HRV	HRV	HRV SVN	SVN	SVN AUT
1	24549-24577 25557-25585	–	–	pr	–	–	–	–	–	–	–	–	–	pr	–
2	24577-24605 25585-25613	–	–	–	–	–	–	–	–	–	–	–	–	–	–
3	24605-24633 25613-25641	pr	pr	pr	pr	pr	pr	pr	pr	pr	pr	pr	pr	pr	pr
4	24633-24661 25641-25669	pr	pr	pr	pr	pr	pr	pr	pr	pr	pr	pr	pr	pr	pr
5	24661-24689 25669-25697	–	–	–	–	–	–	–	–	–	–	–	–	–	–
6	24689-24717 25697-25725	–	–	–	–	–	–	–	–	pr	–	–	–	–	–
7	24717-24745 25725-25753	pr	pr	pr	pr	pr	pr	pr	pr	pr	pr	pr	pr	pr	pr
8	24745-24773 25753-25781	pr	–	–	–	pr	pr	pr	–	–	–	pr	–	–	–
9	24773-24801 25781-25809	–	–	–	–	–	–	–	–	pr	–	–	–	pr	–
10	24801-24829 25809-25837	pr	pr	pr	pr	pr	pr	pr	pr	pr	pr	pr	pr	pr	pr
11	24829-24857 25837-25865	–	–	–	–	pr	–	–	–	–	–	–	–	–	–
12	24857-24885 25865-25893	pr	–	–	–	–	–	pr	–	–	–	–	–	–	–
13	24885-24913 25893-25921	–	–	pr	pr	pr	–	–	–	–	–	pr	pr	pr	–
14	24913-24941 25921-25949	–	–	pr	pr	pr	–	–	–	pr	–	–	–	–	–
15	24941-24969 25949-25977	pr	–	–	–	pr	pr	pr	–	–	–	–	–	–	–
16	24969-24997 25977-26005	pr	pr	pr	–	–	–	pr	pr	pr	pr	pr	pr	pr	pr
17	24997-25025 26005-26033	pr	pr	pr	–	–	–	pr	pr	pr	pr	pr	–	pr	pr
18	25025-25053 26033-26061	–	–	–	–	–	–	–	–	–	–	–	–	–	–

6th Other potential sources of interference

Vehicle radars in the 24 GHz frequency band, as specified by Commission Decision 2005/50/EC amended by implementing decision 2011/485/EU.

In accordance with *implementing decision 2011/485/EU* vehicle radars may be released for commercial circulation until 1 January 2018 in the 24.25-26.65 GHz band (Section 1, point 1). For low-range vehicle radars built into vehicles whose type approval applications have been submitted in accordance with Paragraph (6) of Section 6 of Directive 2007/46/EC of the European Parliament and the Council and have been approved before 1 January 2018, this deadline of 1 January 2018 must be extended by four years (Section 1, point 2. c). Following this date, the accessibility of the 24 GHz band must be terminated for all low-range vehicle radar devices, except devices built in by the factory, or those installed in replacement of such in vehicles registered, released for commercial circulation or commissioned in the Community. That is, the 24 GHz vehicle radars may serve the lifespan of the vehicles they are installed into. Currently the penetration of this use does not reach 0.002% of the vehicles in commercial circulation, therefore no significant interference is expected.

These radars have a broadband emission range, covering the entire 26 GHz communications band, but potential interferences in the upper range of the 26 GHz band is significantly reduces even in the case of direct irradiation.

Interferences caused by vehicle radars must be taken into account by users of the 26 GHz blocks according to *ECC Report 23*.

7th Frequency fees

7th1st One-time fees

No one-time fee has been calculated as yet. Calculations have begun for the expected arrival of renewal applications.

7th2nd Usage fees

For determining the fees to be paid after the use of the 24500-26500 MHz frequency band, the calculation methodology determined in Section 20 titled "Fees to be paid for service type bands with block allocation, sold at an auction or a tender" and Annex 9 of the NMHH Decree 1/2011 (III. 31.) on frequency reservation and usage fees (hereinafter: the Fee Decree) is applicable.

Frequency range	Band multiplier value
24500-26500 MHz	0.002

Calculation method:

- A uniform fee of HUF 7500/kHz per month shall apply to all frequency band sold and acquired.
- This fee shall be multiplied by the cumulative frequency in kHz of bands sold and acquired, and by the band multiplier.
- When defining the amount expressed in kHz of the bands sold and acquired, both parts of duplex bands shall be taken into account.

If any change should come about in the mode of usage (e.g. obligation determined by EU legal regulation, which must be implemented in domestic jurisdiction), the revision of the usage fee is expected.

8th Schedule of the new regulation and sales

According to the EU mandate assigned to CEPT, the CEPT report draft for the band will have to be prepared by March 2018, and the final report by June 2018. According to this, the new harmonised EU regulation may be prepared in the first half of 2018.

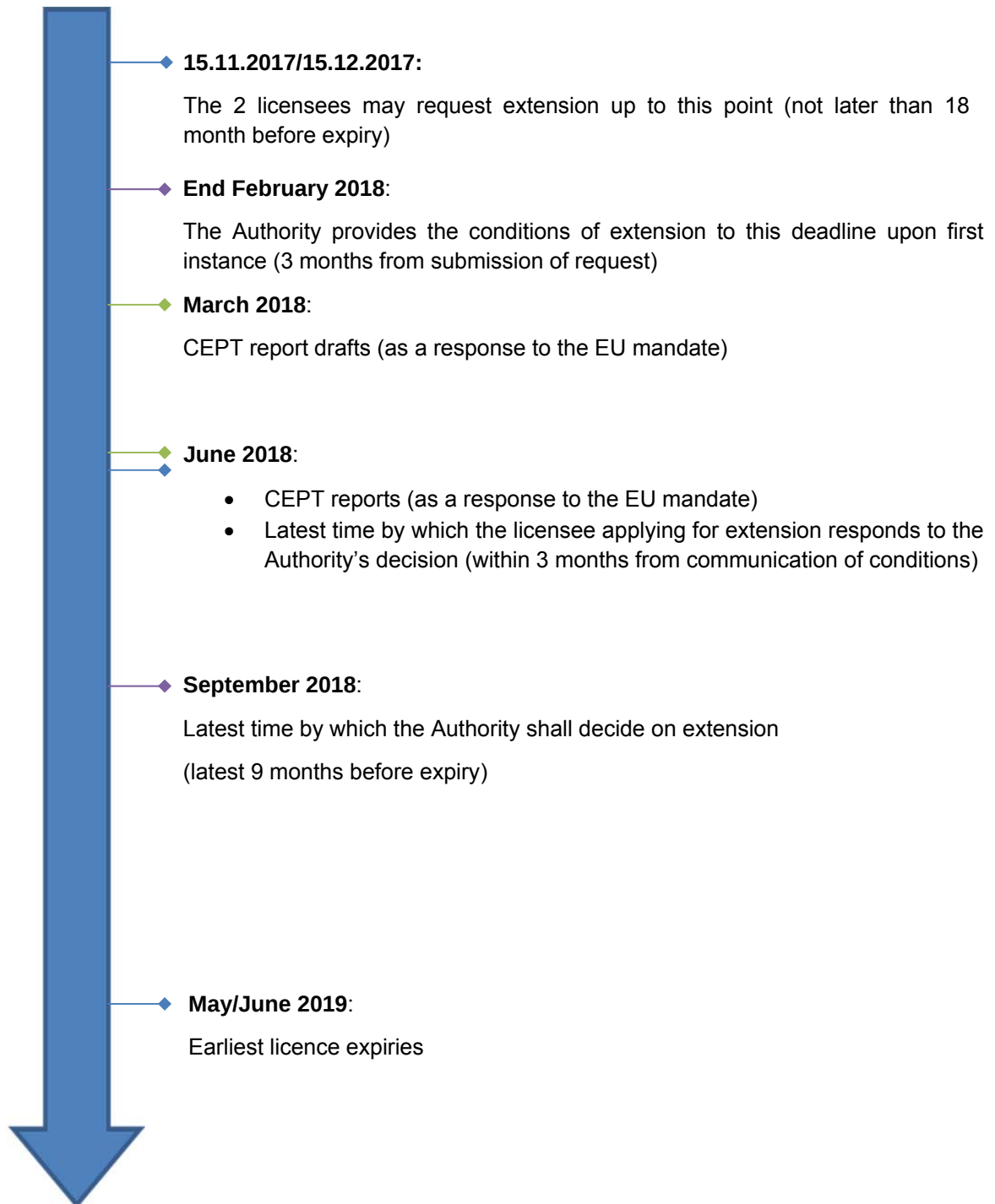


Figure 2: Factors influencing sales

Related documents

- [1] 2005/50/EC: Commission Decision of 17 January 2005 on the harmonisation of the 24 GHz range radio spectrum band for the time-limited use by automotive short-range radar equipment in the Community
- [2] 2011/485/EU: Commission implementing decision of 29 July 2011 amending Decision 2005/50/EC on the harmonisation of the 24 GHz range radio spectrum band for the time-limited use by automotive short-range radar equipment in the Community
- [3] European Commission: Mandate to CEPT to develop harmonised technical conditions for spectrum use in support of the introduction of next-generation (5G) terrestrial wireless systems in the Union
- [4] Radio Spectrum Policy Group: Strategic Roadmap towards 5G for Europe. Opinion on spectrum related aspects for next-generation wireless systems (5G)
- [5] RR Resolution 238 (WRC-15): Studies on frequency-related matters for International MobileTelecommunications identification including possible additional allocations to the mobile services on a primary basis in portion(s) of the frequency range between 24.25 and 86 GHz for the future development of International Mobile Telecommunications for 2020 and beyond
- [6] ECC/REC/(11)01: Guidelines for assignment of frequency blocks for Fixed Wireless Systems in the bands 24.5-26.5 GHz, 27.5-29.5 GHz and 31.8-33.4 GHz
- [7] T/R 13-02: Preferred channel arrangements for fixed service systems in the frequency range 22.0 - 29.5 GHz
- [8] ECC Report 23: Compatibility of automotive collision warning short range radar operating at 24 GHz with FS, EESS and radio astronomy
- [9] ERC Report 099: The analysis of the coexistence of two FWA cells in the 24.5 - 26.5 GHz and 27.5 - 29.5 GHz bands
- [10] MSZ EN 302 217-2-2: Fixed Radio Systems. Characteristics and requirements for point-to-point equipment and antennas. Part 2-2: Digital systems that operate in frequency coordinated frequency bands. Harmonised European standard covering the essential requirements of Article 3 Section (2) of the R&TTE Directive
- [11] MSZ EN 302 217-4-2: Fixed Radio Systems. Characteristics and requirements for point-to-point equipment and antennas. Part 4-2: Antennas. Harmonised European standard covering the essential requirements of Article 3 Section (2) of the R&TTE Directive
- [12] MSZ EN 302 326-2: Fixed Radio Systems. Multipoint equipment and antennas. Part 2: The essential requirements of Article 3(2) of the R&TTE Directive for digital multipoint radio equipment.
- [13] MSZ EN 302 326-3: Fixed Radio Systems. Multipoint equipment and antennas. Part 3: Harmonised European standard covering the essential requirements of Article 3(2) of the R&TTE Directive for Multipoint Radio Antennas.