COMMISSION IMPLEMENTING DECISION (EU) 2022/173

of 7 February 2022

on the harmonisation of the 900 MHz and 1 800 MHz frequency bands for terrestrial systems capable of providing electronic communications services in the Union and repealing Decision 2009/766/EC

(notified under document C(2022) 605)

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

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

Having regard to Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code ([1]),

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) ([2]), and in particular Article 4(3) thereof

Whereas:

(1) As announced in the Commission's Communication *Shaping Europe's Digital Future* of 19 February 2020, digital solutions are crucial to help Europe pursue its own way towards a digital transformation that works for the benefit of citizens and undertakings in compliance with the Union's values. To that end, it is essential that: people benefit from technology; a single market without borders is ensured in which undertakings of all sizes can compete on equal terms; and democratic values, respect for fundamental rights and a sustainable, climate-neutral and resource-efficient economy are pursued. In that context, radio spectrum is a key public resource that is used more and more for an extensive range of commercial and public services.

(2) The way in which radio spectrum policy in the Union is pursued and implemented is to comply with and contribute to freedom of expression, including freedom of opinion and freedom to receive and disseminate information and ideas, irrespective of borders, as well as freedom and plurality of the media, in line with the Union's values under Article 2 of the Treaty of the European Union. Indeed, market access for several operators is necessary to ensure pluralism and freedom of information.

(3) Commission Decision 2009/766/EC ([3]) harmonises the technical conditions for using the radio spectrum in the 880-915 MHz and 925-960 MHz frequency bands ('900 MHz frequency band') and in the 1 710-1 785 MHz and 1 805-1 880 MHz frequency bands ('1 800 MHz frequency band') for terrestrial systems capable of providing electronic communications services in the Union, including wireless broadband services. It ensures compliance with Article 1(1) of Council Directive 87/372/EEC ([4]) as regards the coexistence of terrestrial systems capable of providing electronic communications services with GSM systems in the 900 MHz band.

([1]) OJ L 321, 17.12.2018, p. 36.
([2]) OJ L 108, 24.4.2002, p. 1.
([3]) Commission Decision 2009/766/EC of 16 October 2009 on the harmonisation of the 900 MHz and 1 800 MHz frequency bands for terrestrial systems capable of providing pan-European electronic communications services in the Community (OJ L 274, 20.10.2009, p. 32). This Decision has been amended by Commission Decisions 2011/251/EU and (EU) 2018/637. The latter amendment addresses harmonised technical conditions for the internet of Things.
([4]) Council Directive 87/372/EEC of 25 June 1987 on the frequency bands to be reserved for the coordinated introduction of public pan-European cellular digital land-based mobile communications in the Community (OJ L 196, 17.7.1987, p. 85). This Directive has been amended by Directive 2009/114/EC of the European Parliament and of the Council.

(4) Article 6(3) of Decision No 243/2012/EU of the European Parliament and the Council ([5]) requires Member States to help providers of electronic communication services regularly upgrade their networks to the latest, most efficient technology, in order to create their own spectrum dividends in line with the principles of service and technological neutrality. Therefore, use of the 900 MHz and 1 800 MHz frequency bands with large block sizes of at least 5 MHz in support of next generation (5G) terrestrial wireless systems should be facilitated in pursuance of the objectives of the EU regulatory framework and in compliance with EU law.

(5) The Commission's Communication 'Connectivity for a Competitive Digital Single Market – towards a European Gigabit Society' ([6]) sets out new connectivity objectives for the Union updated with the Commission Communication '2030 Digital Compass: the European way for the Digital Decade' ([7]). Those objectives are to be achieved through the widespread deployment and take-up of very high capacity networks. The Commission Communication '5G for Europe: an Action Plan' ([8]) identifies coordinated actions at Union level, including the identification and harmonisation of 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.

(6) In its two opinions of 16 November 2016 ([9]) and 30 January 2019 ([10]) on a strategic spectrum roadmap towards 5G for Europe, the RSPG identified the need to ensure that the technical and regulatory conditions for all bands already harmonised for mobile networks are fit for 5G use, including the 900 MHz and 1 800 MHz frequency bands, which are currently in use in the Union predominantly for the second (GSM), the third (UMTS) and the fourth (LTE) generation of mobile systems.

(7) On 14 July 2017, in accordance with Article 4(2) of the Radio Spectrum Decision the Commission issued a mandate to the European Conference of Postal and Telecommunications Administrations (CEPT) to review the harmonised technical conditions for use of the 900 MHz and 1 800 MHz bands for terrestrial wireless broadband electronic communications services with the objective to also allow their use by the internet of Things (IoT).

(8) In response to that mandate, on 13 March 2018, the CEPT adopted its CEPT Report 66, which identifies wireless IoT technologies in relation to mobile broadband (i.e. cellular) communications systems and harmonised technical conditions for their use in the 900 MHz and 1 800 MHz frequency bands. Those IoT technologies are Extended Coverage GSM IoT (EC-GSM-IoT), LTE Machine Type Communications (LTE-MTC), LTE evolved Machine Type Communications (LTE-eMTC), and Narrowband IoT (NB-IoT). CEPT Report 66 also concludes that EC-GSM-IoT is an integral part of the GSM system under Directive 87/372/EEC. Therefore, EC-GSM-IoT complies with the technical conditions applicable to a GSM system without any need to amend these conditions.

(9) On 12 July 2018, the Commission issued under Article 4(2) of the Radio Spectrum Decision a mandate to the CEPT to review the harmonised technical conditions for certain EU-harmonised frequency bands, including the 900 MHz and 1 800 MHz frequency bands, and to develop least restrictive harmonised technical conditions suitable for next-generation (5G) terrestrial wireless systems.

(10) In response to that mandate, on 5 July 2019, the CEPT adopted its CEPT Report 72 (Report A) which concludes that within the 900 MHz frequency band, GSM and narrowband terrestrial systems including cellular IoT systems will continue to be in commercial operation for the foreseeable future. This Report stipulates a need for a frequency separation of 200 kHz, when GSM and narrowband terrestrial systems, including cellular IoT systems, are in

([5]) Decision No 243/2012/EU of the European Parliament and of the Council of 14 March 2012 establishing a multiannual radio spectrum policy programme (OJ L 81, 21.3.2012, p. 7).
([6]) COM(2016) 587.
([7]) COM(2021) 118 final.
([8]) COM(2016) 588.
([9]) Document RSPG16-032 final of 9 November 2016, *Strategic roadmap towards 5G for Europe: opinion on spectrum-related aspects for next-generation wireless systems (5G) (RSPG 1st opinion on 5G).*
([10]) Document RSPG19-007 final of 30 January 2019, *Strategic spectrum roadmap towards 5G for Europe: opinion on 5G implementation challenges (RSPG 3rd opinion on 5G).*

operation in the 900 MHz and 1 800 MHz frequency bands. Furthermore, this Report provides also information on the feasibility of using the 900 MHz and 1 800 MHz frequency bands for 5G, including any limitations of the GSM Directive for the 900 MHz band.

(11) In response to that mandate, on 2 July 2021, the CEPT adopted its CEPT Report 80 (Report B), which proposes a harmonised band plan and the least restrictive harmonised technical conditions for the coexistence of narrowband and broadband terrestrial systems capable of providing electronic communications services using the 900 MHz and 1 800 MHz frequency bands, based on the concept of a block edge mask. Those conditions are essential for ensuring technology neutrality in the 900 MHz and 1 800 MHz frequency bands.

(12) CEPT Report 80 defines one block edge mask for narrowband and broadband terrestrial systems using non-active antenna systems, and another block edge mask for broadband terrestrial systems using active antenna systems. GSM and EC-GSM-IoT are not covered by those block edge masks and are technically characterised by references to ETSI standards. On that basis, CEPT Report 80 provides the least restrictive technical conditions for the coexistence of different narrowband and broadband terrestrial systems ([11]) capable of providing electronic communications services within the 900 MHz and 1 800 MHz frequency bands. It also provides the conditions for coexistence of those systems with the GSM system in the 900 MHz frequency band, pursuant to the Council Directive 87/372/EEC.

(13) The block edge masks cover narrowband terrestrial systems with a channel bandwidth of 200 kHz, but excluding GSM and EC-GSM-IoT. They also cover broadband terrestrial systems with a channel bandwidth larger than 200 kHz. The differentiation between narrowband and broadband terrestrial systems is necessary for the implementation of a frequency separation in certain scenarios at national level. In this regard, CEPT Report 80 sets out a frequency separation between the nominal channel edges of adjacent narrowband and broadband terrestrial systems capable of providing electronic communications services as well as between the nominal channel edges of different adjacent narrowband terrestrial systems capable of providing electronic communications services and also GSM and EC-GSM-IoT. The implementation of frequency separation should be managed at the national level. Different approaches could be implemented, depending on the spectrum edges of adjacent terrestrial systems as well as relevant national policies. CEPT Report 80 includes a toolbox for implementing frequency separation.

(14) CEPT Report 80 provides the least restrictive technical conditions for the coexistence of narrowband and broadband terrestrial systems capable of providing electronic communications services with systems in adjacent frequency bands, in particular Railway Mobile Radio (RMR) systems. In this regard, a frequency separation of 200 kHz between the nominal channel edges of a terrestrial system capable of providing electronic communications services and an RMR system, which is adjacent in frequency, may be applied in certain scenarios. Coexistence between GSM systems and RMR should be managed at national level in accordance with the existing regulatory framework.

(15) The harmonised technical conditions set out in CEPT Report 80 constitute the technical basis for this Decision. They should replace the harmonised technical conditions of Decision 2009/766/EC, which are based on references to ETSI standards, while ensuring compatibility with those conditions and their amendment. This should promote legal certainty and technical convergence across the Union in support of economies of scale of equipment and interoperable services in the single market.

(16) Existing rights of use of spectrum in the 900 MHz and 1 800 MHz frequency bands, which are subject to Decision 2009/766/EC, vary across the Member States in terms of assigned block sizes, frequency arrangements or durations of those rights. Therefore, due to different national situations and policy objectives, there is a need to maintain flexibility for the national implementation of the harmonised technical conditions pursuant to this Decision. National flexibility should be time-limited in accordance with Article 53 of Directive (EU) 2018/1972 of the

([11]) Including UMTS, in line with Article 1(1) of Council Directive 87/372/EEC.

European Parliament and of the Council ([12]), to allow the coordinated transition of existing individual rights of use of spectrum to those harmonised technical conditions. Any new or prolonged rights of use of spectrum granted after adoption of this Decision should comply with those harmonised technical conditions. This would foster a Union-wide ecosystem of equipment and services and stimulate 5G deployment in both frequency bands, as well as ensure the continued provision of GSM services in accordance with the GSM Directive.

(17) This Decision should therefore supersede Commission Decision 2009/766/EC. In the interest of legal clarity, Commission Decision 2009/766/EC should be repealed. Its Annex and its relevant provision allowing use of spectrum in the 900 MHz and 1 800 MHz frequency bands for other systems not listed in the Annex should remain applicable for a transitional period.

(18) Cross-border coordination agreements among Member States as well as between Member States and non-EU countries may be necessary to avoid harmful interference and to improve spectrum efficiency and non-fragmentation in spectrum use, in compliance with Article 28 of Directive (EU) 2018/1972.

(19) The notion of 'designating and making available' the 900 MHz and 1 800 MHz frequency bands 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 these bands 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 these bands 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 these bands in accordance with the applicable legal framework at Union level, including the harmonised technical conditions of this Decision.

(20) 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 harmonised technical conditions for the availability and efficient use of the 900 MHz band, in accordance with Directive 87/372/EEC, and of the 1 800 MHz band, for terrestrial systems capable of providing electronic communications services.

Article 2

For the purposes of this Decision, the following definitions shall apply:

(a) 'GSM system' means an electronic communications network as specified by ETSI standards, in particular EN 301 502, EN 301 511, and EN 301 908-18, also including Extended Coverage GSM IoT (EC-GSM-IoT);

(b) '900 MHz band' means the 880-915 MHz and 925-960 MHz bands;

(c) '1 800 MHz band' means the 1 710-1 785 MHz and 1 805-1 880 MHz bands.

Article 3

1. The terrestrial systems capable of providing electronic communications services that can coexist with GSM systems in the 900 MHz band within the meaning of Article 1(1) of Directive 87/372/EEC shall comply with the parameters set out in the Annex within 30 months from the adoption of this Decision.

([12]) 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).

2. Member States shall designate and make available, within 30 months from the adoption of this Decision, on a non-exclusive basis, the 1 800 MHz frequency band for:

(a) GSM systems; and

(b) terrestrial systems capable of providing electronic communications services, in compliance with the parameters set out in the Annex.

Article 4

Member States shall facilitate cross-border coordination agreements to enable operation of GSM systems and the terrestrial systems referred to in Article 3(1) and 3(2)(b), taking into account existing regulatory procedures and rights as well as relevant international agreements, in compliance with EU law.

Article 5

Member States shall ensure that terrestrial systems referred to in Article 3(1) and 3(2)(b) give appropriate protection to systems in adjacent bands.

Article 6

Member States shall keep the use of the 900 MHz and 1 800 MHz bands under permanent review to ensure the efficient use thereof, and in particular report as soon as necessary to the Commission any need for a revision of this Decision, in compliance with EU law.

Article 7

Decision 2009/766/EC is hereby repealed. Its Article 5 and its Annex shall remain applicable for 30 months from the adoption of this Decision.

Article 8

This Decision is addressed to the Member States.

Done at Brussels, 7 February 2022.

For the Commission
Thierry BRETON
Member of the Commission

ANNEX

'*ANNEX*

PARAMETERS REFERRED TO IN ARTICLE 3

1. **Definitions**

Active antenna systems (AAS) means a base station and an antenna system where the amplitude and/or phase between antenna elements is continually adjusted, resulting in an antenna pattern that varies in response to short-term changes in the radio environment. This excludes long-term beam shaping such as fixed electrical down tilt. In AAS base stations the antenna system is integrated as part of the base station system or product.

Non-active antenna systems (non-AAS) means a base station and an antenna system that provides one or more antenna connectors, which are connected to one or more separately designed passive antenna elements to radiate radio waves. The amplitude and phase of the signals to the antenna elements is not continually adjusted in response to short-term changes in the radio environment.

Equivalent isotropically radiated power (EIRP) is the product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna (absolute or isotropic gain).

Total radiated power (TRP) is a measure of how much power a composite antenna radiates. It equals the total conducted power input into the antenna array system less any losses in the antenna array system. TRP means the integral of the power transmitted in different directions over the entire radiation sphere, as shown in the formula:

$$TRP \stackrel{\text{def}}{=} \frac{1}{4\pi}\int_0^{2\pi}\int_0^{\pi} P(\theta,\varphi)\sin(\theta)d\theta d\varphi$$

where P(ϑ,φ) is the power radiated by an antenna array system in direction (ϑ,φ) given by the formula:

$$P(\theta,\varphi) = P_{Tx}g(\theta,\varphi)$$

where P_{Tx} denotes the conducted power (measured in Watts), which is input to the array system, and g(ϑ,φ) denotes the array systems directional gain along the (ϑ, φ) direction.

Narrowband system is a terrestrial system capable of providing electronic communications services operating in a 200 kHz channel ([1]), excluding any GSM system.

Broadband system is a terrestrial system capable of providing electronic communications services operating in a channel larger than 200 kHz ([2]).

2. **Frequency arrangement**

Within the 900 MHz band, the frequency arrangement shall be as follows:

(1) The duplex mode of operation is Frequency Division Duplex (FDD). The duplex spacing shall be 45 MHz, with terminal station transmission ("900 MHz FDD uplink") located in the lower part of the band starting at 880 MHz and finishing at 915 MHz ("900 MHz lower band") and base station transmission ("900 MHz FDD downlink") located in the upper part of the band starting at 925 MHz and finishing at 960 MHz ("900 MHz upper band").

(2) The assigned block size shall generally provide the opportunity to access at least 5 MHz of contiguous spectrum. If smaller block sizes are assigned, they shall be in multiples of 200 kHz.

([1]) An example of such a system is NB-IoT.

([2]) Examples of such systems are: LTE, including LTE Machine Type Communications and LTE evolved Machine Type Communications; UMTS; WiMAX; 5G New Radio.

(3) The 900 MHz lower band, or portions thereof, can be used for uplink-only operation ([3]) without paired spectrum within the 900 MHz upper band.

(4) The 900 MHz upper band, or portions thereof, can be used for downlink-only operation ([4]) without paired spectrum within the 900 MHz lower band.

(5) Base station and terminal station transmission shall comply with the technical conditions specified in Sections 4, 5 and 6, respectively.

Within the 1 800 MHz band, the frequency arrangement shall be as follows:

(6) The duplex mode of operation is Frequency Division Duplex (FDD). The duplex spacing shall be 95 MHz, with terminal station transmission ("1 800 MHz FDD uplink") located in the lower part of the band starting at 1 710 MHz and finishing at 1 785 MHz ("1 800 MHz lower band") and base station transmission ("1 800 MHz FDD downlink") located in the upper part of the band starting at 1 805 MHz and finishing at 1 880 MHz ("1 800 MHz upper band").

(7) The assigned block size shall generally provide the opportunity to access at least 5 MHz of contiguous spectrum. If smaller block sizes are assigned, they shall be in multiples of 200 kHz.

(8) The 1 800 MHz lower band, or portions thereof, can be used for uplink-only operation[3] without paired spectrum within the 1 800 MHz upper band.

(9) The 1 800 MHz upper band, or portions thereof, can be used for downlink-only operation[4] without paired spectrum within the 1 800 MHz lower band.

(10) Base station and terminal station transmission shall comply with the technical conditions specified in Sections 4, 5 and 6, respectively.

3. **Frequency separation**

Frequency separations are required to ensure coexistence in the absence of bilateral or multilateral frequency coordination agreements between neighbouring systems, without precluding less stringent technical parameters if agreed among the operators of such systems.

In the absence of frequency coordination, a frequency separation of 200 kHz shall be applied between the nominal channel edges of adjacent systems as follows:

(1) a narrowband system and a broadband system, both complying with the block edge mask ([5]);

(2) two different types of narrowband systems, both complying with the block edge mask;

(3) a GSM system, and either a narrowband system or a broadband system, both complying with the block edge mask.

In the case of a narrowband system operating in the guard-band mode ([6]) of a relevant broadband system, a frequency separation of 200 kHz or more shall be applied between the channel edge of that narrowband system and the edge of the operator's block, taking into account existing guard bands between operators' block edges or the edge of the operating band (adjacent in frequency to other services). That narrowband system shall operate only in channel bandwidths of the relevant broadband system of 10 MHz or higher.

([3]) Such as supplemental uplink.
([4]) Such as supplemental downlink.
([5]) Refer to Section 4 of this Annex.
([6]) I.e. on the side of a frequency block used for the broadband system.

Depending on the national circumstances as regards the deployment of terrestrial systems capable of providing electronic communications services and railway mobile radio ([7]) systems, a frequency separation of 200 kHz may be applied between the nominal channel edges of those systems at the frequency border of 925 MHz in the following cases:

(a) a railway mobile radio system operating in a 200 kHz channel, which is adjacent in frequency to a broadband system;

(b) a railway mobile radio system operating in a channel larger than 200 kHz, which is adjacent in frequency to a narrowband system;

(c) a railway mobile radio system operating in a 200 kHz channel, which is adjacent in frequency to a narrowband system of a different type.

The implementation of the frequency separation of 200 kHz shall be managed at national level ([8]), with the objective of ensuring efficient spectrum use.

4. **Technical conditions for base stations – block edge mask**

The technical parameters for base stations, called block edge mask (BEM) set out in this section, are essential to ensuring coexistence between neighbouring electronic communications networks in the absence of bilateral or multilateral agreements between operators of such neighbouring networks. BEMs relate to technical conditions attached to the rights of use of radio spectrum and the avoidance of interference between radio spectrum users who benefit from such rights.

Operators of electronic communications networks in the 900 MHz or 1 800 MHz frequency bands may agree, on a bilateral or multilateral basis, less stringent technical parameters provided that they continue to comply with the technical conditions applicable for the protection of other services, applications or networks and with their obligations resulting from cross-border coordination.

A BEM is an emission mask that defines power levels as a function of frequency relative to the edge of a block of spectrum assigned (or licensed) to an operator. It consists of several elements, as defined in Table 1.

The baseline power limit ensures that the spectrum of other operators within either the 900 MHz or the 1 800 MHz frequency band is protected. The additional baseline power limit is an out-of-band limit, which ensures that spectrum for services and applications outside either the 900 MHz or the 1 800 MHz frequency band is protected. The transitional region power limit enables a roll-off of power levels from the in-block to the baseline power limit and ensures co-existence with other operators in adjacent blocks.

The BEMs set out in this Annex do not apply to GSM systems.

Table 1

Definition of BEM elements

BEM element	Definition
In-block	Assigned spectrum block for which the BEM is derived.
Baseline	Spectrum within either the 900 MHz or 1 800 MHz frequency band used for terrestrial systems capable of providing electronic communications services, not including the operator's block under consideration and corresponding transitional regions.
Transitional region	Spectrum adjacent to an operator's block.
Additional baseline	Spectrum within bands adjacent to either the 900 MHz or the 1 800 MHz frequency band, where specific power limits apply for the protection of other services.

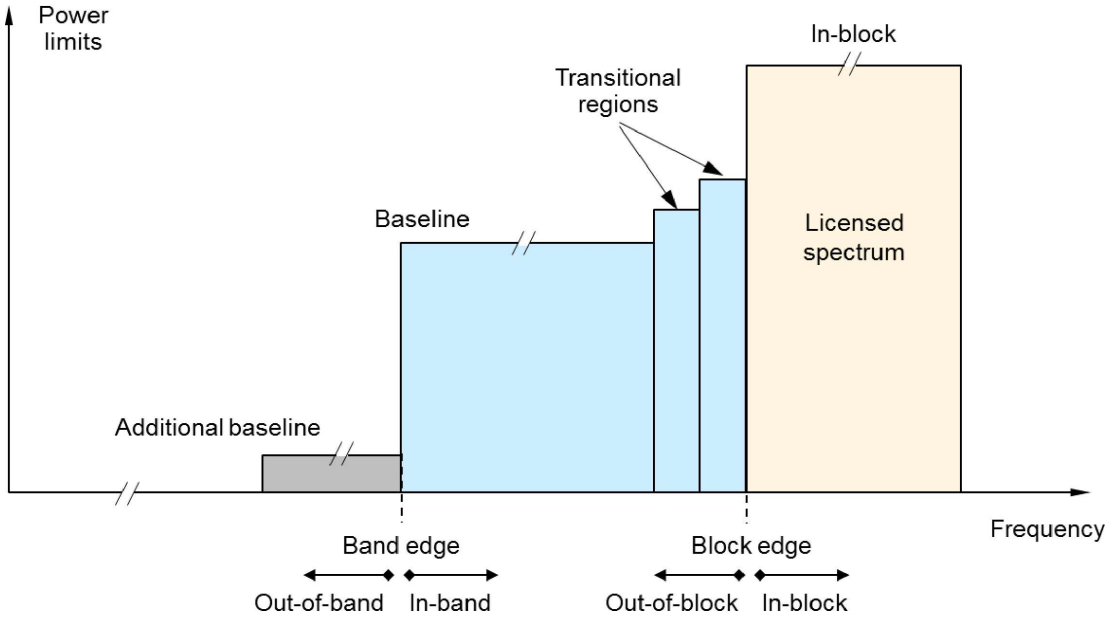
([7]) Railway mobile radio comprises the Global System for Mobile Communications-Rail (GSM-R) and its successors, including the Future Railway Mobile Communication System (FRMCS). Harmonised spectrum for railway mobile radio systems is subject to Commission Decision (EU) 2021/1730.

([8]) CEPT Report 80 contains a toolbox for implementing a frequency separation between different terrestrial systems capable of providing electronic communications services.

Figure 1 shows a general BEM applicable to either the 900 MHz or the 1 800 MHz frequency band.

Figure 1

Illustration of a block edge mask



Power limits are provided separately for non-AAS and AAS. For non-AAS, the power limits apply to the mean EIRP; for AAS, they apply to the mean TRP. The mean EIRP or mean TRP are measured by averaging over a time interval and over a frequency bandwidth. In the time domain, the mean EIRP or mean TRP is averaged over the active portions of signal bursts and corresponds to a single power control setting. In the frequency domain, the mean EIRP or mean TRP is measured over a frequency bandwidth as given in Tables 3, 4 and 5 below. In general, and unless stated otherwise, the BEM power limits correspond to the aggregate power radiated by the relevant device including all transmit antennas, except in the case of baseline, transition and additional baseline power limits for non-AAS base stations, which are specified per antenna.

The technical conditions for non-AAS base stations apply to terrestrial systems capable of providing electronic communications services using both the 900 MHz and 1 800 MHz frequency bands. The technical conditions for AAS base stations apply to terrestrial systems capable of providing electronic communications services using the 1 800 MHz frequency band. AAS base stations shall not be used in the 900 MHz frequency band.

Equipment operating in either the 900 MHz or 1 800 MHz frequency band may also make use of technical parameters other than those set out below, provided that appropriate mitigation techniques are applied. These mitigation techniques must comply with Directive 2014/53/EU of the European Parliament and of the Council [9] and offer at least an equivalent level of protection to that provided by the essential requirements of that Directive.

[9] 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).

Table 2

In-block power limits for non-AAS and AAS base stations

BEM element	**Non-AAS EIRP limit**	**AAS TRP limit** (only for the 1 800 MHz frequency band)
In-block	Not obligatory. If an upper limit is set by a Member State, a value between 63 dBm/(5 MHz) and 67 dBm/(5 MHz) per antenna may be applied for a broadband system, and a value between 60 dBm/(200 kHz) and 69 dBm/(200 kHz) per antenna may be applied for a narrowband system.	Not obligatory. If an upper limit is set by a Member State, a value of 58 dBm/(5 MHz) per cell (*) may be applied.

(*) In a multi-sector base station, the radiated power limit applies to each of the individual sectors.

Explanatory note to Table 2

For locations where a coordination procedure with adjacent services applies, Member States can set an upper limit to the radiated power.

Table 3

Baseline power limits for non-AAS and AAS base stations

BEM element	**Frequency range**	**Non-AAS maximum mean EIRP limit per antenna**	**AAS maximum mean TRP limit per cell** (only for the 1 800 MHz frequency band) (*)
Baseline	FDD downlink blocks	+ 3 dBm/MHz	- 6 dBm/MHz

(*) In a multi-sector base station, the radiated power limit applies to each of the individual sectors.

Table 4

Transitional region power limits for non-AAS and AAS base stations

BEM element	**Frequency range**	**Non-AAS maximum mean EIRP limit per antenna** (*)	**AAS maximum mean TRP limit per cell** (only for the 1 800 MHz frequency band) (**)
Transitional region	0 to 0,2 MHz offset from block edge	32,4 dBm/(0,2 MHz)	17,4 dBm/(0,2 MHz)
	0,2 to 1 MHz offset from block edge	13,8 dBm/(0,8 MHz)	4,7 dBm/(0,8 MHz)
	1 to 5 MHz offset from block edge	5 dBm/MHz	– 4 dBm/MHz
	5 to 10 MHz offset from block edge	12 dBm/(5 MHz)	3 dBm/(5 MHz)

(*) The non-AAS EIRP limits could be relaxed at national level, either if agreed among all affected operators of terrestrial systems capable of providing electronic communications services or in accordance with national implementation already in place.
(**) In a multi-sector base station, the radiated power limit applies to each of the individual sectors.

Table 5

Additional baseline power limits for non-AAS base stations

BEM element	Applicable frequency range	Non-AAS maximum mean EIRP limit per antenna (*) (**)
Additional baseline	0 to 0,2 MHz offset from block edge	32,4 dBm/(0,2 MHz)
	0,2 to 1 MHz offset from block edge	13,8 dBm/(0,8 MHz)
	1 to 5 MHz offset from block edge	5 dBm/MHz
	5 to 10 MHz offset from block edge	12 dBm/(5 MHz)
	> 10 MHz offset from block edge (***)	3 dBm/MHz

(*) Provided that adjacent services, applications and networks remain protected above 960 MHz, below 1 805 MHz and above 1 880 MHz, higher EIRP limits may be applied for non-AAS base stations on a case-by-case basis at national level. Namely, (a) EIRP limits of up to 6 dB higher are allowed in the range of 0 to 0,2 MHz from the band edge to support in-block conducted power of a narrowband system higher than 49 dBm/(200 kHz) (i.e. up to 55 dBm/(200 kHz)), (b) EIRP limits of up to 11 dB higher are allowed in the range of 0 to 10 MHz from the band edge to support higher antenna gain than 18 dBi (i.e. up to 29 dBi).

(**) Provided that adjacent services, applications and networks remain protected below 925 MHz, higher EIRP limits may be applied to non-AAS base stations on a case-by-case basis at national level.

(***) The spurious value in Section 5 applies for a frequency spacing of more than 10 MHz from the band edge.

Explanatory note to Table 5

Table 5 applies only to the out-of-band domain in line with Figure 1 and Table 1. This implies that the applicable frequency range entirely falls within the out-of-band domain.

For AAS base stations, the out-of-block limits given in Tables 3 and 4 also apply to the out-of-band domain in the range of 0 to 10 MHz from the band edge, as appropriate, considering the position of the assigned spectrum block.

5. **Other conditions**

The spurious emission domain for base stations in the 900 MHz and 1 800 MHz frequency bands starts at a frequency spacing of 10 MHz from the respective band edge ([10]).

Terrestrial systems capable of providing electronic communications services using AAS shall not be granted more protection from systems in adjacent bands than terrestrial systems capable of providing electronic communications services using non-AAS.

6. **Technical conditions for terminal stations**

AAS terminal stations shall not be used in the 900 MHz or 1 800 MHz frequency bands.

Table 6

In-block power limit for terminal stations

BEM element	Maximum mean power limit (*)
In-block	25 dBm' (**)

(*) The power limit recommended above for mobile terminal stations is specified as TRP. The in-block radiated power limit for fixed/nomadic terminal stations may be agreed on a national basis provided that protection of other services, networks and applications is not compromised and cross-border obligations are fulfilled.

(**) It is recognised that this value includes a possible tolerance of up to +2 dB, to take account of operation under extreme environmental conditions and production spread. This value does not include test tolerance.

([10]) Relevant limits are provided in ERC Recommendation 74-01.