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RADIO SPECTRUM COMMITTEE

Working Document

Subject: Final draft Commission Decision on harmonised technical conditions of use in the 790-862 MHz frequency band for terrestrial systems capable of providing electronic communications services in the European Union

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EUROPEAN COMMISSION

Brussels,
C(2010)

Draft

COMMISSION DECISION

of [...]

on harmonised technical conditions of use in the 790-862 MHz frequency band for terrestrial systems capable of providing electronic communications services in the European Union

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COMMISSION DECISION

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on harmonised technical conditions of use in the 790-862 MHz frequency band for terrestrial systems capable of providing electronic communications services in the European 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)¹, and in particular Article 4(3) thereof,
Whereas:

- (1) The Commission Communication ‘Transforming the digital dividend into social benefits and economic growth’² stressed the importance of coherent opening of the 790-862 MHz band (the ‘800 MHz band’) for electronic communications services by adopting technical conditions of use. The 800 MHz band is part of the digital dividend, i.e. radio frequencies that are freed up as a result of more efficient spectrum use through the switchover from analogue to digital terrestrial TV. The identified socio-economic benefits are based on the assumption of a Community approach that releases the 800 MHz band by 2015 and imposes technical conditions preventing high power cross-border interference.
- (2) Technological neutrality and service neutrality have been confirmed by Directive 2009/140/EC of 25 November 2009 amending Directives 2002/21/EC on a common regulatory framework for electronic communications networks and services, Directive 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities, and 2002/20/EC on the authorisation of electronic communications networks and services³ (Better Regulation Directive). Moreover, the RSPG opinion of 18 September 2009 on the digital dividend encourages the application of the WAPECS principles and recommends that the Commission acts on the recommendations contained therein as soon as possible in order to minimise EU-level uncertainty regarding the ability of Member States to make available the 800 MHz band.
- (3) The European Parliament in its resolution of 24 September 2008 on reaping the full benefits of the digital dividend in Europe: a common approach to the use of the

¹ OJ L 108, 24.4.2002, p. 1.

² COM(2009) 586.

³ OJ L 337, 18.12.2009, p.37.

spectrum released by the digital switchover, urges Member States to release their digital dividends as quickly as possible and calls for a response at Community level. The Council conclusions of 18 December 2009 on transferring the digital dividend into social benefits and economic growth confirm the Council's position stated in 2008, which invited the Commission to support and assist the Member States in the process of achieving close cooperation between Member States and with third countries in coordinating spectrum usage and of reaping the full benefits of the digital dividend.

- (4) Noting the strong impact of broadband communications on growth, the Economic Recovery Plan⁴ has set a target of 100% broadband coverage by between 2010 and 2013⁵. This cannot be achieved without a significant role being played by wireless infrastructures, including in the provision of broadband to rural areas, part of which can be done by giving early access to the digital dividend to the benefit of such areas.
- (5) The designation of the 800 MHz band for terrestrial systems capable of providing electronic communications services would be an important element addressing the convergence of the mobile, fixed and broadcasting sectors and reflecting technical innovation. The services provided in this frequency band should mainly target end-user access to broadband communications, including broadcasting content.
- (6) Pursuant to Article 4(2) of the Radio Spectrum Decision, on 3 April 2008 the Commission gave a mandate to the European Conference of Postal and Telecommunications Administrations (hereinafter 'the CEPT') to define the technical conditions to be applied to the 800 MHz band optimised for, but not limited to, fixed and/or mobile communications networks, with a particular focus on common and minimal (least restrictive) technical conditions, the most appropriate frequency arrangement and a recommendation on how to handle Programme Making and Special Events (PMSE) services.
- (7) In response to that mandate, the CEPT has adopted four reports (CEPT Reports 29, 30, 31 and 32). These contain technical conditions for base stations and terminal stations operating in the 800 MHz band. Such harmonised technical conditions will facilitate economies of scale without requiring any type of particular technology to be used, based on optimised parameters for the most likely use of the band.
- (8) CEPT Report 29 gives guidance on cross-border coordination issues which are of particular relevance during the coexistence phase, i.e. when some Member States may have implemented the technical conditions optimised for fixed and/or mobile communications networks, while other Member States still have high-power broadcasting transmitters in operation in the 800 MHz band. CEPT considers that the Final Acts of the International Telecommunication Union Regional Radiocommunication Conference for planning of the digital terrestrial broadcasting service in parts of Regions 1 and 3, in the frequency bands 174-230 MHz and 470-862 MHz (GE06 Agreement) provides the necessary regulatory procedures for cross-border coordination.
- (9) CEPT Report 30 identifies least restrictive technical conditions through the concept of Block-Edge Masks (BEMs), which are regulatory requirements aimed at managing the

⁴ *Presidency Conclusions*, Council of the European Union, Brussels, 12 December 2008, 17271/08.

⁵ Endorsed by the Council: Competitiveness Council *Key Issues Paper*, March 2009.

risk of harmful interference between neighbouring networks and are without prejudice to limits set in equipment standards under Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (the R&TTE Directive)⁶. Based on this CEPT Report the BEMs are optimised for, but are not limited to, fixed and/or mobile communications networks using Frequency-Division Duplexing (FDD) and/or Time-Division Duplexing (TDD).

- (10) In cases where harmful interference has been caused or where it is reasonably considered that it could be caused, the measures identified in CEPT Report 30 could also be supplemented by proportionate national measures that could be imposed.
- (11) The avoidance of harmful interference and disturbance to television receiver equipment, including cable TV equipment, may depend on more effective interference rejection in such equipment. Conditions related to television receiver equipment should be addressed as a matter of urgency within the framework of the Directive 2004/108/EC of the European Parliament and the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility (EMC Directive⁷).
- (12) The avoidance of harmful interference to television receiver equipment, including cable TV equipment, may also depend on in-block and out-of-band emission limits for terminal stations. Conditions related to terminal stations should be addressed as a matter of urgency within the framework of the R&TTE Directive in line with the elements developed in CEPT Report 30.
- (13) CEPT Report 31 concludes that the preferred frequency arrangement for the 800 MHz band should be based on the FDD mode in order to facilitate cross-border coordination with broadcasting services, noting that such an arrangement would not discriminate in favour of or against any currently envisaged technology. This does not exclude the possibility for Member States to use other frequency arrangements with the aim of (a) achieving general interest objectives, (b) ensuring greater efficiency through market-based spectrum management, (c) ensuring greater efficiency when sharing with existing rights of use during a coexistence period, or (d) avoiding harmful interference, e.g. in coordination with third countries. When designating or making available the 800 MHz band for terrestrial systems capable of providing electronic communications services, Member States are therefore to use the preferred frequency arrangement or alternative arrangements described in CEPT Report 31.
- (14) CEPT Report 32 recognises the interest in the continued operation of applications for PMSE and identifies a number of potential frequency bands and innovative technical developments as a solution to the current use of the 800 MHz band by these applications. Administrations should continue to study the available options and the efficiency of PMSE systems with the aim of including their findings in the regular reports to the Commission on effective use of spectrum.
- (15) The results of the mandate to the CEPT should be made applicable in the European Union and implemented by the Member States from the moment they designate the 800 MHz band for networks other than high-power broadcasting networks, given the

⁶ OJ L 91, 7.4.1999, p. 10.

⁷ OJ L 390, 21.12.2004, p. 24.

urgency identified by the European Parliament, the Council and the RSPG as well as the increasing demand identified in studies at European and global levels for terrestrial electronic communications services providing broadband communications.

- (16) While there is an urgent need to have common technical conditions for the efficient use of the 800 MHz band by systems capable of providing electronic communications services, in order to ensure that any action taken in the immediate future by one or more Member States does not diminish the benefit of a harmonised European approach, the timing has direct implications for the organisation of broadcasting services by Member States in their national territories.
- (17) Member States may decide individually whether and at what point in time they designate or make available the 800 MHz band for networks other than high-power broadcasting networks, and this Decision is without prejudice to the use of the 800 MHz band for public order and public security purposes and defence in some Member States.
- (18) No deadline should be defined by the Commission by which the Member States must allow the use of the 800 MHz band for systems capable of providing electronic communications services; this will be decided if and when appropriate by the Parliament and Council, upon a proposal from the Commission.
- (19) The designation and making available of the 800 MHz band in accordance with the results of the mandate to the CEPT recognises the fact that there are other radio applications not covered by this Decision. In so far as coexistence with a radio application is not addressed in CEPT Reports 29, 30, 31 or 32, appropriate sharing criteria for coexistence may be based on national considerations.
- (20) Optimal use of the 800 MHz band in cases where neighbouring Member States or third countries have decided on different uses will require constructive coordination of cross-border transmissions with the objective of an innovative approach by all parties, taking into account the RSPG opinions of 19 June 2008 on spectrum issues concerning outer EU borders and of 18 September 2009 on the digital dividend. Member States should have due regard for the need to coordinate with Member States that continue to avail of existing high-power broadcasting rights. They should also facilitate future reorganisation of the 800 MHz band to allow, in the long term, optimum use by low- and medium-power systems capable of providing electronic communications services. In the particular case of coexistence with aeronautical radio navigation systems, which requires technical measures in addition to BEMs, Member States should develop bilateral or multilateral agreements.
- (21) The use of the 800 MHz band by other existing applications in third countries can limit the introduction and use of this band for terrestrial systems capable of providing electronic communications services in several Member States, and this will have to be taken into account in any future decision to set a deadline by which the Member States must allow the use of the 800 MHz band for such terrestrial systems. Information on such limitations will be notified to the Commission pursuant to Articles 7 and 6(2) of the Radio Spectrum Decision and published in accordance with Article 5 of this Decision.

- (22) In order to ensure effective use of the 800 MHz band also in the longer term, administrations should continue to study solutions that may increase efficiency and innovative use. Such studies should be taken into account when considering a review of this Decision.
- (23) 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 aims to harmonise the technical conditions for the availability and efficient use of the 790-862 MHz band (800 MHz band) for terrestrial systems capable of providing electronic communications services in the European Union.

Article 2

- (1) When they designate or make available the 800 MHz band for networks other than high-power broadcasting networks, Member States shall do so, on a non-exclusive basis, for terrestrial systems capable of providing electronic communications services in compliance with the parameters set out in the Annex to this Decision.
- (2) Member States shall ensure that systems referred to in paragraph 1 give appropriate protection to systems in adjacent bands.
- (3) Member States shall facilitate cross-border coordination agreements with the aim of enabling the operation of systems referred to in paragraph 1, taking into account existing regulatory procedures and rights.
- (4) Member States shall not be bound to implement the obligations under this Decision in geographic areas where spectrum coordination with third countries requires a deviation from the parameters set out in the Annex to this Decision, provided that they notify the relevant information to the Commission, including the affected geographic areas, and publish it pursuant to Radio Spectrum Decision.
Member States shall make all practicable efforts to resolve such deviations and inform the Commission thereof.

Article 3

Member States shall keep the use of the 800 MHz band under scrutiny and report their findings to the Commission upon request. The Commission shall, were appropriate, proceed to a review of this Decision.

Article 4

This Decision is addressed to the Member States.

Done at Brussels, [...]

For the Commission

Member of the Commission

ANNEX
Parameters referred to in Articles

The technical conditions presented in this Annex are in the form of frequency arrangements and block-edge masks (BEMs). A BEM is an emission mask that is defined, as a function of frequency, relative to the edge of a block of spectrum for which rights of use are granted to an operator. It consists of in-block and out-of-block components which specify the permitted emission levels over frequencies inside and outside the licensed block of spectrum, respectively.

The BEM levels are built up by combining the values listed in the tables below in such a way that the limit at any frequency is given by the highest (least stringent) value of (a) the baseline requirements, (b) the transition requirements, and (c) the in-block requirements (where appropriate). The BEMs are presented as upper limits on the mean equivalent isotropically radiated power (EIRP) or total radiated power (TRP)⁸ over an averaging time interval, and over a measurement frequency bandwidth. In the time domain, the EIRP or TRP is averaged over the active portions of signal bursts and corresponds to a single power control setting. In the frequency domain, the EIRP or TRP is determined over the measurement bandwidth specified in the following tables⁹. In general, and unless stated otherwise, the BEM levels correspond to the power radiated by the relevant device irrespective of the number of transmit antennas, except in the case of transition requirements for base stations, which are specified per antenna.

BEMs shall be applied as an essential component of the technical conditions necessary to ensure coexistence between services at national level. However, it should be understood that the derived BEMs do not always provide the required level of protection of victim services and additional mitigation techniques would need to be applied in a proportionate manner at national level in order to resolve any remaining cases of interference.

Member States shall also ensure that operators of terrestrial systems capable of providing electronic communications services in the 800 MHz band can use less stringent technical parameters than those set out below provided that the use of these parameters is agreed among all affected parties and that these operators continue to comply with the technical conditions applicable for the protection of other services, applications or networks and with obligations resulting from cross-border coordination.

Equipment operating in this band may also make use of power limits other than those set out below provided that appropriate mitigation techniques are applied which comply with Directive 1999/5/EC and which offer at least an equivalent level of protection to that provided by these technical parameters.

The term block edge refers to the frequency boundary of an authorised right of use. The term band edge refers to the boundary of a range of frequencies designated for a certain use.

⁸ TRP is a measure of how much power the antenna actually radiates. The TRP is defined as the integral of the power transmitted in different directions over the entire radiation sphere.

⁹ The actual measurement bandwidth of the measurement equipment used for purposes of compliance testing may be smaller than the measurement bandwidth provided in the tables.

A. General parameters

- (1) Within the band 790-862 MHz the frequency arrangement shall be as follows:
 - (a) The assigned block sizes shall be in multiples of 5 MHz.
 - (b) The duplex mode of operation shall be FDD with the following arrangements. The duplex spacing shall be 41 MHz with base station transmission (down link) located in the lower part of the band starting at 791 MHz and finishing at 821 MHz and terminal station transmission (up link) located in the upper part of the band starting at 832 MHz and finishing at 862 MHz.
- (2) Notwithstanding Part A(1), but provided the technical conditions of Part B and Part C of this Annex are applied, Member States may implement alternative frequency arrangements with the aim of (a) achieving general interest objectives, (b) ensuring greater efficiency through market-based spectrum management, (c) ensuring greater efficiency when sharing with existing rights of use during a coexistence period, or (d) avoiding interference.

B. Technical conditions for FDD or TDD base stations (BS)

- (1) In-block limits:

An in-block EIRP limit for base stations is not obligatory. However, Member States may set limits and, unless otherwise justified, such limits would normally lie within the range 56 dBm/5MHz to 64 dBm/5MHz.

- (2) Out-of-block limits:

Table 1: Baseline requirements — BS BEM out-of-block EIRP limits

Frequency range of out-of-block emissions	Maximum mean out-of-block EIRP	Measurement bandwidth
Frequencies used for FDD uplink	-49.5 dBm	5 MHz
Frequencies used for TDD	-49.5 dBm	5 MHz

Table 2: Transition requirements — BS BEM out-of-block EIRP limits per antenna¹⁰ over frequencies of FDD downlink and TDD

Frequency range of out-of-block emissions	Maximum mean out-of-block EIRP	Measurement bandwidth
-10 to -5 MHz from lower block edge	18 dBm	5 MHz
-5 to 0 MHz from lower block edge	22 dBm	5 MHz
0 to +5 MHz from upper block edge	22 dBm	5 MHz
+5 to +10 MHz from upper block edge	18 dBm	5 MHz
Remaining FDD downlink frequencies	11 dBm	1 MHz

¹⁰ For one to four antennas.

Table 3: Transition requirements — BS BEM out-of-block EIRP limits per antenna¹¹ over frequencies used as guard band

Frequency range of out-of-block emissions	Maximum mean out-of-block EIRP	Measurement Bandwidth
Guard band between broadcasting band edge at 790 MHz and FDD downlink band edge ¹²	17.4 dBm	1 MHz
Guard band between broadcasting band edge at 790 MHz and TDD band edge	15 dBm	1 MHz
Guard band between FDD downlink band edge and FDD uplink band edge (duplex gap) ¹³	15 dBm	1 MHz
Guard band between FDD downlink band edge and TDD band edge	15 dBm	1 MHz
Guard band between FDD uplink band edge and TDD band edge	15 dBm	1 MHz

Table 4: Baseline requirements — BS BEM out-of-block EIRP limits over frequencies below 790 MHz

Case	Condition on base station in-block EIRP, P dBm/10 MHz	Maximum mean out-of-block EIRP	Measurement bandwidth	
A	For TV channels where broadcasting is protected	$P \geq 59$	0 dBm	8 MHz
		$36 \leq P < 59$	(P-59) dBm	8 MHz
		$P < 36$	-23 dBm	8 MHz
B	For TV channels where broadcasting is subject to an intermediate level of protection	$P \geq 59$	10 dBm	8 MHz
		$36 \leq P < 59$	(P-49) dBm	8 MHz
		$P < 36$	-13 dBm	8 MHz
C	For TV channels where broadcasting is not protected	No conditions	22 dBm	8 MHz

Cases A, B, and C listed in Table 4 can be applied per broadcasting channel and/or per region so that the same broadcasting channel may have different levels of protection in different geographic areas and different broadcasting channels may have different levels of protection in the same geographic area. Member States shall apply the baseline requirement in case A in circumstances where digital terrestrial broadcasting channels are in use at the time of deployment of terrestrial systems capable of providing electronic communications services. Member States may apply the baseline requirements in cases A, B or C in circumstances where the relevant broadcasting channels are not in use at the time of deployment of terrestrial systems capable of providing electronic communications services. They shall take into account that cases A and B reserve the option of bringing relevant broadcasting channels into

¹¹ For one to four antennas.

¹² 790 MHz to 791 MHz for the frequency arrangement described in Part A(1).

¹³ 821 MHz to 832 MHz for the frequency arrangement described in Part A(1).

use for digital terrestrial broadcasting at a future date, while case C is appropriate where there are no plans to bring the relevant broadcasting channels into use.

C. Technical conditions for FDD or TDD terminal stations (TS)

**Table 5: In-block requirements — TS BEM in-block emission limit
over frequencies of FDD uplink and TDD**

Maximum mean in-block power	23 dBm ¹⁴
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Member States may relax the limit in Table 5 for specific deployments, e.g. fixed terminal stations in rural areas, provided that protection of other services, networks and applications is not compromised and cross-border obligations are fulfilled.

¹⁴ This power limit is specified as EIRP for terminal stations designed to be fixed or installed and as TRP for terminal stations designed to be mobile or nomadic. EIRP and TRP are equivalent for isotropic antennas. It is recognised that this value is subject to a tolerance of up to +2 dB, to take account of operation under extreme environmental conditions and production spread.