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**COMMISSION IMPLEMENTING DECISION**

**of 5.11.2012**

**on the harmonisation of the frequency bands 1920-1980 MHz and 2110-2170 MHz for terrestrial systems capable of providing electronic communications services in the Union**

(Text with EEA relevance)

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THE EUROPEAN COMMISSION,

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

Having regard to Decision 676/2002/EC of the European Parliament and of the Council of 7 March 2002 on a regulatory framework for radio spectrum policy in the European Community (Radio Spectrum Decision)<sup>1</sup>, and in particular Article 4(3) thereof,

Whereas:

- (1) On 14 December 1998, the European Parliament and the Council adopted Decision 128/1999/EC on the coordinated introduction of a third-generation mobile and wireless communications system (UMTS) in the Community (UMTS Decision)<sup>2</sup> covering the frequency bands 1900-1980 MHz, 2010-2025 MHz and 2110-2170 MHz ('the terrestrial 2 GHz band'). According to that Decision, Member States were to take all necessary actions in order to allow the coordinated and progressive introduction of the UMTS services on their territory by 1 January 2002 at the latest and in particular were to establish an authorisation system for UMTS by 1 January 2000 at the latest. This Decision expired on 22 January 2003, but the harmonisation of the spectrum has remained in place.
- (2) The Commission has since then supported a more flexible use of spectrum in its Communication on "Rapid access to spectrum for wireless electronic communications services through more flexibility"<sup>3</sup>, which inter alia addresses the terrestrial 2 GHz band and aims to avoid disruption of the market. The principles of technological neutrality and service neutrality have been confirmed by Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services (Framework Directive)<sup>4</sup>.
- (3) The designation of the paired sub-bands 1920-1980 MHz and 2110-2170 MHz ('the paired terrestrial 2 GHz band') for systems capable of providing electronic

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<sup>1</sup> OJ L 108, 24.4.2002, p. 1.

<sup>2</sup> OJ L 17, 22.1.1999, p. 1.

<sup>3</sup> COM(2007)50.

<sup>4</sup> OJ L 108, 24.4.2002, p. 33

communications services is an important element addressing the convergence of the mobile, fixed and broadcasting sectors and reflecting technical innovation. Systems deployed in the paired terrestrial 2 GHz band should mainly target end-user access to broadband services.

- (4) Users of wireless broadband services for which the paired terrestrial 2 GHz band is already used today in one Member State can also gain access to equivalent services in any other Member State. However, the unpaired sub-band 1900-1920 MHz, although licensed to operators in many Member States, remains largely unused, and the unpaired sub-band 2010-2025 MHz is licensed to operators just in few Member States and not used.
- (5) Pursuant to Article 4(2) of Decision 676/2002/EC, the Commission gave on 15 June 2009 a mandate to the European Conference of Postal and Telecommunications Administrations (the 'CEPT') to develop least restrictive technical conditions for frequency bands addressed in the context of the Wireless Access Policy for Electronic Communications Services (WAPECS).
- (6) In response to that mandate, the CEPT has issued a report (CEPT Report 39) containing least restrictive technical conditions and guidance for their application to base stations and terminal stations operating in the terrestrial 2 GHz band. In the paired terrestrial 2 GHz band, these technical conditions are appropriate to manage the risk of harmful interference between neighbouring networks at national and cross-border level without imposing any particular type of technology and based on optimised parameters for the most likely use of the band. In the unpaired sub-bands 1900-1920 MHz and 2010-2025 MHz ('the unpaired terrestrial 2 GHz band') however, the technical conditions contained in CEPT Report 39 are more restrictive for the operation of mobile networks than stipulated in current existing national rights of use.
- (7) In accordance with CEPT Report 39 the concept of Block Edge Masks (BEM), which are technical parameters that apply to the entire block of spectrum of a specific user, irrespective of the number of channels occupied by the user's chosen technology, would be appropriate. These masks are intended to form part of the authorisation conditions for spectrum usage. They cover both emissions within the block of spectrum (i.e. in-block power) as well as emissions outside the block (i.e. out-of-block emission). They are regulatory requirements aimed at managing the 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 (R&TTE Directive)<sup>5</sup>.
- (8) The technical conditions defined as a result of the mandate to CEPT also aim to protect existing applications in adjacent bands against harmful interference. For that purpose, compliance with the existing spectrum emission mask for UMTS should be ensured below 1900 MHz, between 1980 and 2010 MHz, between 2025 and 2110 MHz and above 2170 MHz. In so far as coexistence with another radio application is not addressed in CEPT Report 39 and the Electronic Communications Committee's

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<sup>5</sup> OJ L 91, 7.4.1999, p. 10. Directive as amended by Regulation (EC) No 1882/2003 of the European Parliament and of the Council (OJ L 284, 31.10.2003, p. 1).

ERC Report 65, which the CEPT Report 39 uses as a basis, appropriate sharing criteria for coexistence could also be defined based on national considerations.

- (9) The results of CEPT Report 39 should be made applicable in the Union and implemented by the Member States taking into account the existing rights of use in the terrestrial 2 GHz band for UMTS and the effective use of spectrum.
- (10) However, given the restrictive technical conditions on transmission power levels for the unpaired terrestrial 2 GHz band set out in CEPT Report 39 – in order to protect operations in the paired terrestrial 2 GHz band and ensure co-existence of multiple TDD networks – as well as the limited overall bandwidth of the unpaired terrestrial 2 GHz band, the take-up of wireless broadband services under the current license conditions is obstructed. This situation requires studying alternative harmonisation measures for the unpaired terrestrial 2 GHz band and may entail modification of existing licences. In order not to prevent the early introduction of flexibility of use in the paired terrestrial 2 GHz band, the separation of harmonisation measures for the paired and unpaired terrestrial 2 GHz bands becomes necessary.
- (11) Technical harmonisation conditions should be introduced only for the paired terrestrial 2 GHz band without prejudice to the right of Member States to organise the authorisation of the use of the terrestrial 2 GHz band taking into consideration the rights of use in existence under their jurisdiction and in line with Union law, and in particular Directive 2002/20/EC of the European Parliament and of the Council of 7 March 2002 on the authorisation of electronic communications networks (Authorisation Directive)<sup>6</sup>, and Articles 9 and 9a of Directive 2002/21/EC.
- (12) Harmonisation under this Decision should not exclude the possibility for a Member State to apply, where justified and taking into account existing rights of use, transitional periods that could include radio spectrum sharing arrangements, pursuant to Article 4(5) of Decision 676/2002/EC.
- (13) In order to ensure effective use of the paired terrestrial 2 GHz band also in the long term, administrations should continue with studies that may increase efficiency and innovative use. Such studies should be taken into account when considering a review of this Decision.
- (14) 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 at harmonising the conditions for the availability and efficient use of the frequency bands 1920-1980 MHz and 2110-2170 MHz (hereafter 'the paired terrestrial 2 GHz band') for terrestrial systems capable of providing electronic communications services in the Union.

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<sup>6</sup> OJ L 108, 24.4.2002, p. 21.

## *Article 2*

1. By 30 June 2014 at the latest, or whenever applying Article 9a of Directive 2002/21/EC at an earlier date to an existing right or issuing new rights to use part or all of the paired terrestrial 2 GHz band, Member States shall designate and make available, on a non-exclusive basis, the paired terrestrial 2 GHz band for terrestrial systems capable of providing electronic communications services, in compliance with the parameters set out in the Annex.
2. By way of derogation from paragraph 1 and pursuant to Article 4(5) of Decision 676/2002/EC, Member States may request transitional periods that may include radio spectrum sharing arrangements and that shall expire by 24 May 2016 at the latest.
3. Member States shall ensure that the systems referred to in paragraph 1 give appropriate protection to systems in adjacent bands.
4. Member States shall facilitate cross-border coordination agreements with the aim of enabling the operation of the systems referred to in paragraph 1, taking into account existing regulatory procedures and rights.

## *Article 3*

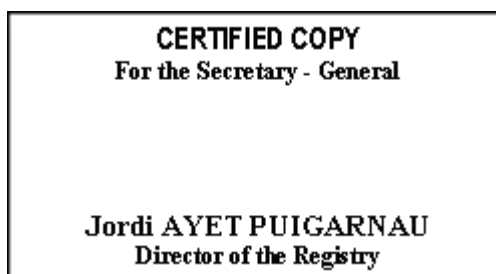
Member States shall keep the use of the paired terrestrial 2 GHz band under scrutiny and report their findings to the Commission to allow regular and timely review of this Decision.

## *Article 4*

This Decision is addressed to the Member States.

Done at Brussels, 5.11.2012

*For the Commission*  
*Neelie KROES*  
*Vice-President*



## ANNEX

### Parameters referred to in Article 2(1)

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)<sup>7</sup> 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 point B(2), Tables 1, 2 and 3<sup>8</sup>. In general, and unless stated otherwise, the BEM levels correspond to the aggregate power radiated by the relevant device including all transmit antennas, except in the case of baseline and 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, also with respect to adjacent bands.

Member States shall also ensure that operators of terrestrial systems capable of providing electronic communications services can use less stringent technical parameters than those set out below in points A, B and C 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.

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<sup>7</sup> 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. EIRP and TRP are equivalent for isotropic antennas.

<sup>8</sup> 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

Within the paired terrestrial 2 GHz band, the frequency arrangement shall be as follows:

(1) The duplex mode of operation shall be Frequency Division Duplex (FDD). The duplex spacing shall be 190 MHz with terminal station transmission (FDD uplink) located in the lower part of the band starting at 1920 MHz and finishing at 1980 MHz and base station transmission (FDD downlink) located in the upper part of the band starting at 2110 MHz and finishing at 2170 MHz.

(2) The spectrum block edge nearest to 1920 MHz starts at 1920.3 MHz or above<sup>9</sup>. The spectrum block edge nearest to 1980 MHz ends at 1979.7 MHz or below<sup>10</sup>. The spectrum block edge nearest to 2110 MHz starts at 2110.3 MHz or above<sup>11</sup>. The spectrum block edge nearest to 2170 MHz ends at 2169.7 MHz or below<sup>12</sup>.

Base station and terminal station transmission within the paired terrestrial 2 GHz band shall be in compliance with the BEMs in this Annex.

## B. Technical conditions for FDD base stations

### (1) In-block requirements

An in-block EIRP limit for base stations is not obligatory. However, Member States may set an EIRP limit of between 61dBm/5MHz and 65dBm/5MHz in the FDD downlink band, noting that this limit can be increased for specific deployments, e.g. in areas of low population density provided that this does not significantly increase the risk of terminal station receiver blocking.

### (2) Out-of-block requirements

Table 1

**Baseline requirements — base station BEM out-of-block EIRP limits per antenna<sup>13</sup>**

<b>Frequency range of out-of-block emissions of FDD downlink</b>	<b>Maximum mean out-of-block EIRP</b>	<b>Measurement bandwidth</b>
Frequencies spaced more than 10 MHz from the lower or upper block edge	9 dBm	5 MHz

<sup>9</sup> Member States may decide to reduce this frequency to 1920.0 MHz for consistency with conditions of existing authorisations.

<sup>10</sup> Member States may decide to increase this frequency to 1980.0 MHz for consistency with conditions of existing authorisations.

<sup>11</sup> Member States may decide to reduce this frequency to 2110.0 MHz for consistency with conditions of existing authorisations

<sup>12</sup> Member States may decide to increase this frequency to 2170.0 MHz for consistency with conditions of existing authorisations

<sup>13</sup> The BEM level is defined per antenna and applicable to base station configuration with up to four antennas per sector

Table 2

**Transition requirements — base station BEM out-of-block EIRP limits per antenna<sup>14</sup>**

<b>Frequency range of out-of-block emissions of FDD downlink</b>	<b>Maximum mean out-of-block EIRP</b>	<b>Measurement bandwidth</b>
-10 to -5 MHz from lower block edge	11 dBm	5 MHz
-5 to 0 MHz from lower block edge	16.3 dBm	5 MHz
0 to +5 MHz from upper block edge	16.3 dBm	5 MHz
+5 to +10 MHz from upper block edge	11 dBm	5 MHz

**C. Technical conditions for FDD terminal stations**

Table 3

**In-block requirements — terminal station BEM in-block emission limit over frequencies of FDD uplink**

<b>Maximum mean in-block power<sup>15</sup></b>	24 dBm <sup>16</sup>
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Member States may relax the limit set out in Table 3 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.

<sup>14</sup> The BEM level is defined per antenna and applicable to base station configuration with up to four antennas per sector

<sup>15</sup> 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 may be subject to a tolerance defined in the harmonised standards to take account of operation under extreme environmental conditions and production spread.

<sup>16</sup> For the determination of out of band emissions of terminals in CEPT Report 39 the maximum conducted transmit power of 23 dBm has been used as a reference