



# ECC Decision (06)01

The harmonised utilisation of the bands 1920-1980 MHz and 2110-2170 MHz for mobile/fixed communications networks (MFCN) including terrestrial IMT systems<sup>1</sup>

**Approved 24 March 2006**

**Amended 02 November 2012**

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<sup>1</sup> Comparable technical specifications to those given in this ECC Decision are given in Commission Implementing Decision 2012/688/EU. EU Member States and, if so approved by the EEA Joint Committee, Iceland, Liechtenstein and Norway are obliged to implement the EC Decision.

## EXPLANATORY MEMORANDUM

### 1 INTRODUCTION

This ECC/DEC/(06)01 which initially entered into force on 24 March 2006 and addressed both paired (1920-1980 MHz and 2110-2170 MHz) and unpaired (1900-1920 MHz and 2010-2025 MHz) frequency bands aimed at providing a common approach:

- for the planning and use of spectrum and channelling arrangements within the bands 1900-1980 MHz, 2010-2025 MHz and 2110-2170 MHz;
- for making available spectrum for IMT-2000/UMTS subject to market demand thus ensuring efficient and effective use of these frequency bands within the CEPT.
- ECC/DEC/(05)05 follows a similar approach for addressing the IMT-2000/UMTS extension band (2500-2690 MHz).

The original version of ECC/DEC/(06)01 replaced the following earlier ERC Decisions:

- ERC/DEC/(97)07 on the frequency bands for the introduction of the Universal Mobile Telecommunications System (UMTS);
- ERC/DEC/(99)25 on the harmonised utilisation of spectrum for terrestrial Universal Mobile Telecommunications Systems (UMTS) operating in the bands 1900-1980 MHz, 2010-2025 MHz and 2110-2170 MHz; and
- ERC/DEC/(00)01 extending ERC/DEC/(97)07 on the frequency bands for the introduction of terrestrial Universal Mobile Telecommunications System (UMTS).

ECC conducted in 2010-2011 a review of this ECC Decision taking into account the information on the practical implementation and authorisations in force.

The band 1900-1920 MHz, although licensed in many countries, remains not much used at the time when this revision was made, and the use of frequencies in the band 2010-2025 MHz has been authorised in few countries only. Frequency arrangements for these frequency bands have been removed from the revision of this ECC Decision. Further investigations are needed to develop a suitable ECC framework for those bands.

The bands 1920-1980 MHz and 2110-2170 MHz have been used widely in Europe for IMT-2000 networks deploying UMTS technology. For these frequency bands, the technical conditions including the frequency arrangements and the Block Edge Masks (only for the band 2110-2170 MHz) have been updated or introduced.

The updated frequency arrangements allow the deployment of systems with channel bandwidths other than 5 MHz by defining the block edge frequency instead of the carrier centre frequency, enabling the deployment of larger channel bandwidths.

### 2 BACKGROUND

WARC'92 identified a total of 230 MHz spectrum for third generation mobile radio systems, known as IMT-2000 (then known as FPLMTS) at 2 GHz.

In 1997 the core frequency bands for Universal Mobile Telecommunications Systems (UMTS) in Europe were identified by the CEPT in ERC/DEC/(97)07. This ECC Decision designated 155 MHz of spectrum to terrestrial UMTS applications with an additional 60 MHz for UMTS satellite services. In Europe, the 15 MHz spectrum at 1885-1900 MHz identified by WARC'92 for IMT-2000 was not designated for UMTS in ERC/DEC/(97)07 due to current usage of this band by DECT. The ECC Decision required that administrations make available at least 2x40 MHz from within these bands by 2002. Subsequently, in response to "Mandate 1" of the European Commission to CEPT, ERC/DEC/(00)01 extended ERC/DEC/(97)07 to require that administrations make available the entire 155 MHz of terrestrial spectrum for

UMTS and other systems included in the IMT-2000 family by 1 January 2002, subject to geographical spread market demand and national licensing schemes.

Within the IMT-2000 family, the UMTS terrestrial radio access (UTRA) has been developed with 2 modes of operation: a Frequency Division Duplex (FDD) mode and a Time Division Duplex (TDD) mode. The FDD mode provides efficient operation in many UMTS environments, providing wide area coverage and full mobility applications. The TDD mode however may allow operators flexibility in network deployment and to support traffic asymmetry in an efficient way.

In 1999 the ERC adopted ERC/DEC/(99)25 on the harmonised utilisation of spectrum for terrestrial UMTS operating within the bands 1900-1980 MHz, 2010-2025 MHz and 2110-2170 MHz. This requested that, subject to market demand, administrations make provisions to allow the operation of UMTS self provided applications in a self-coordinating mode in the frequency band 2010-2020 MHz. It also indicated that the designation of this band for UMTS self provided applications may be reviewed two years after the date of entry into force. ERC/DEC/(99)25 was developed under "Mandate 2" of the European Commission to CEPT. More than five years after the entry into force of ERC/DEC/(99)25, it has become clear that the anticipated market for UMTS self provided applications has not materialised.

In July 1999, the European Commission issued "Mandate 3" for the development of a common plan to identify, with a view to make available between the years 2005 and 2010, additional frequency spectrum for the provision of terrestrial 3G mobile and wireless services in the Community. This resulted in a European Common Proposal (ECP) for 160 MHz of additional spectrum for the terrestrial component of IMT-2000.

"Mandate 4" of the European Commission to CEPT has triggered a decision process intended to guarantee that sufficient additional spectrum for third generation mobile and wireless communication systems will be made available in the European Union in due time, in a coordinated manner and based on market demand. The Commission proposed that CEPT should follow a staged approach for the deliverables requested by "Mandate 4", ultimately leading to the adoption, by 31 March 2003, of an ECC Decision designating the additional frequency bands to be used for IMT-2000 systems and defining a 'reference date' by which the additional spectrum should become available. The outcome of the preliminary investigations undertaken by CEPT and the validation of its findings should be described in a Report from CEPT to be delivered to the Commission by 30 November 2002. This Report from CEPT should provide a validation of the initial proposals developed by CEPT and the basis for the decisions subsequently enshrined in a formal ECC Decision.

Finally, in March 2005, the ECC finally adopted ECC/DEC/(05)05 on the harmonized utilisation of spectrum for IMT-2000/UMTS systems operating within the band 2500-2690 MHz. This ECC Decision was developed in response to "Mandate 5" of the European Commission to CEPT "to harmonize the frequency usage within the additional frequency band of 2500-2690 MHz to be made available for IMT-2000/UMTS systems in Europe".

In December 2004 the European Commission sent a liaison statement to CEPT highlighting the results of a questionnaire to Member States on use of the band 2010-2025 MHz. This indicated, "... that there does not seem to be any interest for self provided applications which are currently foreseen in the band 2010-2020 MHz...".

The revision of ECC/DEC/(06)01 aims at providing the most suitable frequency arrangement for the bands 1920-1980/2110-2170 MHz to respond to future market demand.

The revision of ECC/DEC/(06)01 has modified the band plans and reduced the number of options relative to FDD or TDD operations. The band 1920-1980 MHz is now designated only for FDD uplink operations.

In June 2009, the European Commission issued a mandate to develop common and minimal (least restrictive) technical conditions for the 2 GHz bands.

CEPT Report 39 is the CEPT response to this Mandate. This Report deals with the band plan for the 2 GHz bands as described in the original version of ECC/DEC/(06)01, with the following assumptions:

- 2x60 MHz FDD in the bands 1920-1980 MHz paired with 2110-2170 MHz;

- the bands 1900-1920 MHz and 2010-2025 MHz can be used for TDD operation or FDD uplink transmission paired with another frequency band.

This CEPT Report 39 was built on the work carried out in ERC Report 065, by considering developments in characteristics of systems operating in adjacent bands and by considering technology neutral approach to allow technologies other than UMTS to be deployed. It was found that the conclusions of ERC Report 065 remain valid.

Further to the review conducted in 2010-2011, ECC decided to focus the revision of this framework on paired bands only. Another framework will be developed for the unpaired bands.

Consequently, the revision of the ECC Decision has enabled to introduce the least restrictive technical conditions as defined in Annex 2 (requirements for FDD base stations).

The implementation of this ECC Decision may encompass different stages at the national level with a varying complexity depending on the legal and regulatory framework as well as the existing licensing situation of each country.

Transition from the existing framework is envisaged to be implemented at the national level, via national consultation processes, when issuing or amending rights of use.

### **3 REQUIREMENT FOR AN ECC DECISION**

The purpose of this ECC Decision is to harmonise the use of the bands 1920-1980 MHz and 2110-2170 MHz for mobile/fixed communications networks (MFCN) including terrestrial IMT systems, while:

- ensuring efficient and effective use of these frequencies within the CEPT;
- defining the use of the bands 1920-1980 MHz / 2110-2170 MHz for FDD operation only; and
- including the relevant least restrictive technical conditions, based on CEPT Report 39, as defined in Annex 2 covering the downlink FDD frequency band (i.e. 2110-2170 MHz).

The ECC recognises that such a harmonisation will maximise the benefit to operators, manufacturers as well as users and will facilitate the continued development of MFCN including terrestrial IMT systems within the CEPT.

**ECC DECISION OF 24 MARCH 2006; ON THE HARMONISED UTILISATION OF SPECTRUM FOR TERRESTRIAL IMT-2000/UMTS SYSTEMS OPERATING WITHIN THE BANDS 1900-1980 MHz, 2010-2025 MHz AND 2110-2170 MHz  
AMENDED 02 NOVEMBER 2012 ON THE HARMONISED UTILISATION OF THE BANDS 1920-1980 MHz AND 2110-2170 MHz FOR MOBILE/FIXED COMMUNICATIONS NETWORKS (MFCN) INCLUDING TERRESTRIAL IMT SYSTEMS (ECC DECISION (06)01)**

“The European Conference of Postal and Telecommunications Administrations,

*considering*

- a) that there is a large demand for interoperable mobile voice services and interoperable mobile data services;
- b) that terrestrial IMT systems have been developed to meet this demand;
- c) that detailed specifications of IMT radio interfaces are described in ITU-R Recommendation M.1457 and ITU-R Recommendation ITU-R M.2012;
- d) that IMT comprises both IMT-2000 and IMT-Advanced, as defined in Resolution ITU-R 56 (on Naming for International Mobile Telecommunications);
- e) that the terrestrial IMT radio interfaces contain two modes of operation: Frequency Division Duplex (FDD) and Time Division Duplex (TDD) but the revision of this ECC Decision addresses FDD operation only;
- f) that a harmonised spectrum scheme for IMT, taking due account of the protection requirements of IMT and other radio services, allows efficient use of the spectrum, in particular in border areas;
- g) that ITU approved Report ITU-R M.2078 on the estimated spectrum bandwidth requirements for the future development of IMT-2000 and IMT-Advanced;
- h) that “mobile/fixed communications networks” (MFCN) for the purpose of this ECC Decision includes IMT and other communications networks in the mobile and fixed services;
- i) that there could be differences in the market demand for spectrum for MFCN, in different CEPT countries, which could lead to different timescales for the introduction and evolution of MFCN within the bands 1920-1980 MHz and 2110-2170 MHz;
- j) that, based on CEPT Report 39, the least restrictive technical conditions are defined in Annex 2 (requirements for FDD base stations);
- k) that in EU/EFTA countries the radio equipment that is under the scope of this ECC Decision shall comply with the R&TTE Directive. Conformity with the essential requirements of the R&TTE Directive may be demonstrated by compliance with the applicable harmonised European standard(s) or by using the other conformity assessment procedures set out in the R&TTE Directive;
- l) that ERC/DEC/(97)07, ERC/DEC/(99)25 and ERC/DEC/(00)01 were withdrawn by the original version of this ECC Decision;
- m) that authorisations have been granted for the bands 1900-1920 MHz and 2010-2025 MHz based on the technical conditions as contained in the original version of this ECC Decision of 24 March 2006.

*DECIDES*

1. that the frequency bands 1920-1980 MHz and 2110-2170 MHz are designated for MFCN including terrestrial IMT systems;
2. that administrations shall make provisions to allow the harmonised utilisation of spectrum in the frequency bands 1920-1980 MHz and 2110-2170 MHz for MFCN including terrestrial IMT systems, as identified in Annexes 1 and 2 to this ECC Decision;
3. that the frequency bands in Decides 2 shall be made available for MFCN including terrestrial IMT systems as from the entry into force of this ECC Decision, subject to market demand and national licensing schemes;
4. that this ECC Decision shall enter into force on 02 November 2012;
5. that the preferred date for implementation of this ECC Decision shall be 01 May 2013;
6. that CEPT Member administrations shall communicate the national measures implementing this ECC Decision to the ECC Chairman and the Office when the ECC Decision is nationally implemented.

*Note:*

*Please check the Office documentation database <http://www.ecodocdb.dk> for the up to date position on the implementation of this and other ECC Decisions.*

**ANNEX 1: HARMONISED SPECTRUM SCHEME FOR MFCN INCLUDING TERRESTRIAL IMT SYSTEMS**

1. The frequency band 1920-1980 MHz is paired with 2110-2170 MHz for FDD operation.
2. The duplex direction for FDD carriers in these bands is mobile transmit within the lower band and base transmit within the upper band.
3. For licensing purposes, the bands 1920-1980 MHz and 2110-2170 MHz, are divided into twelve paired blocks and the minimum block size should be in the range 4.8 MHz to 5.0 MHz.
4. The block edge nearest to 1920 MHz should start at 1920.3 MHz or above<sup>2</sup>.
5. The block edge nearest to 1980 MHz should end at 1979.7 MHz or below<sup>3</sup>.
6. The block edge nearest to 2110 MHz should start at 2110.3 MHz or above<sup>4</sup>.
7. The block edge nearest to 2170 MHz should end at 2169.7 MHz or below<sup>5</sup>.

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<sup>2</sup> Where necessary, this frequency can be lowered to 1920.0 MHz for consistency with conditions of some existing authorisations.

<sup>3</sup> Where necessary, this frequency can be raised to 1980.0 MHz for consistency with conditions of some existing authorisations.

<sup>4</sup> Where necessary, this frequency can be lowered to 2110.0 MHz for consistency with conditions of some existing authorisations.

<sup>5</sup> Where necessary, this frequency can be raised to 2170.0 MHz for consistency with conditions of some existing authorisations.

## **ANNEX 2: TECHNICAL CONDITIONS BASED ON THE BEM APPROACH APPLICABLE TO FDD BASE STATIONS (IN THE BAND 2110-2170 MHz)**

The technical conditions presented in this Annex are in the form of Block Edge Masks (BEMs) based on CEPT Report 39. BEMs are related to spectrum licensing and the avoidance of interference between users of spectrum.

A BEM is an emission mask that is defined as a function of frequency, relative to the edge of a block of spectrum that is licensed 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.

Accordingly, 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 transition requirements, and b) the in-block requirements (where appropriate). The BEMs are applicable only within the sub-band 2110-2170 MHz.

They have to be applied together with the requirements of Annex 1 which ensure coexistence between MFCN systems and other applications operating in adjacent bands.

These BEMs are optimised for, but not limited to, fixed/mobile communications networks (two-way). They are derived for macro base stations (BS) only in this Annex, and might not be appropriate for all other classes of base stations.

The BEM is applied as an essential component of the necessary conditions for the coexistence in the absence of bilateral or multilateral agreements between mobile networks in adjacent frequency blocks in the 2 GHz band, without precluding less stringent technical parameters if agreed among the operators of such networks.

An administration should ensure that operators to which it has granted authorisations in this band are free to enter into bilateral or multilateral agreements to develop less stringent technical parameters and, if agreed among all affected parties, these less stringent technical parameters may be used, if the level of protection for other networks (not party to the agreement) is not affected.

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 for the case of MFCN base station transition requirements which are specified per antenna.

### **A2.1 TECHNICAL CONDITIONS FOR MFCN BASE STATIONS (FDD)**

#### **A2.1.1 In-block limits for FDD MFCN Base Station**

An in-block e.i.r.p. limit for BS is not necessary as long as the “BS FDD to BS TDD” scenario does not need to be addressed. However, administrations may choose to set an e.i.r.p. limit for BS if needed on a national or local basis (e.g. to limit the risk of terminal station receiver blocking).

#### **A2.1.2 Out-of-block limits for FDD MFCN Base Station**

Table 1 defines the out-of-block BEM requirements for MFCN base stations within the spectrum licensed to operators of MFCN networks.

It should be noted that these requirements have been derived from the characteristics of macro base stations, with the assumption of an in-block e.i.r.p. limit of 61 dBm/5 MHz.

**Table 1: Transition requirements – BS BEM out-of-block e.i.r.p. limits per antenna<sup>6</sup>**

Frequency range of out-of-block emissions	Maximum mean out-of-block e.i.r.p.	Measurement bandwidth
-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
Other blocks	9 dBm	5 MHz

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<sup>6</sup> The BEM level for base stations is defined as per antenna. It is applicable to base station configurations with up to four antennas per sector.