

# ECC Decision (11)06

Harmonised frequency arrangements for mobile/fixed communications networks (MFCN) operating in the bands 3400-3600 MHz and 3600-3800 MHz<sup>1</sup>

9 December 2011

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<sup>1</sup> Comparable technical specifications to those given in this ECC Decision are given in Commission Decision 2008/411/EC. 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

The harmonised frequency arrangements for the 3400-3800 MHz band in this ECC Decision are intended to facilitate high data rate mobile/fixed communications networks (MFCN) including International Mobile Telecommunications (IMT) services supported by larger channel bandwidths as an evolution to the existing framework without the consequential requirement for a replacement of systems based on the existing regulatory framework. It aims at providing the basis to the mobile industry and administrations to respond to the growth of mobile broadband and technological developments for wider channel bandwidths and increased data rates.

Since WRC-07, the 3400-3600 MHz band has been allocated on a primary basis to the mobile, except aeronautical mobile, service and identified for IMT in almost all CEPT member countries.

The term IMT covers IMT-2000 and IMT-Advanced systems. A wide range of systems are defined: 6 IMT-2000 radio interfaces and 2 IMT-Advanced radio interfaces ensuring a competitive environment.

Recommendation ITU-R M.1036 (on frequency arrangements for implementation of the terrestrial component of IMT) will be revised to include, among others, the arrangement(s) for the 3400-3600 MHz band.

In parallel, the IMT-Advanced process is on-going in ITU-R, in cooperation with standardisation organisations.

The former ERO carried out a survey in 2008 which found diverse implementation of BWA/FWA within 3400-3800 MHz in CEPT countries, including some IMT systems. This is reflected in various licensing coverages (national, regional), various frequency blocks choices (different portions of the 3400-3800 MHz). Moreover, the paired blocks are used in TDD mode.

In so far as is practicable, these frequency arrangements are intended to be technology neutral and capable of facilitating competitive provision of services using a range of technologies and modes (fixed, nomadic and mobile) with sufficient flexibility to accommodate current wireless broadband services deployed in the band.

### 2 BACKGROUND

In addition to this ECC Decision, the following CEPT regulatory framework is in force for broadband and fixed wireless access systems (BWA/FWA) in the 3400-3800 MHz band:

- The ECC/REC/(04)05, that offers guidelines for accommodation and assignment of multipoint fixed wireless systems in the frequency bands 3400-3600 MHz and 3600-3800 MHz;
- The ECC/DEC/(07)02, on availability of frequency bands between 3400-3800 MHz for the harmonised implementation of Broadband Wireless Access systems (BWA). This Decision refers to ECC Recommendation (04)05 for frequency arrangements. The revision of this Decision is scheduled for 2012.

Commission Decision 2008/411/EC on the harmonisation of the 3400-3800 MHz frequency band for terrestrial systems capable of providing electronic communications services in the Community is based on the results of studies in response to EC mandates that are documented in CEPT Reports 15 and 19 (which defines least restrictive technical conditions for 3400-3800 MHz).

CEPT will conduct additional analysis to determine whether the existing least restrictive technical conditions (BEM) are suitable also for the high data rate IMT services supported by larger channel bandwidths as foreseen in the context of this ECC Decision.

Consistency is ensured with the development of the ITU-R band plan in the bands 3400-3600 MHz.

CEPT considered the band 3.4-3.8 GHz as two separate bands:

1. a lower band 3.4-3.6 GHz and
2. an upper band 3.6-3.8 GHz.

In this ECC Decision, CEPT took into account the two possible duplex modes, Frequency Division Duplex (FDD) and Time Division Duplex (TDD). In the case of a TDD operation, it is beneficial to synchronise the TDD networks of different operators to avoid restricted blocks / guard bands between operators and therefore facilitates an efficient use of spectrum. CEPT noted the lack of interest from industry for a FDD arrangement in the 3.6-3.8 GHz frequency band.

CEPT took into account existing CEPT results on coexistence with other services and the potential impact on these services, such as FSS usage, in these bands.

The implementation of this ECC Decision will encompass different stages at the national level (e.g. national consultation processes and update of existing authorisations as required) with a varying complexity depending on the legal and regulatory framework of each country.

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

The ECC recognises that implementation of MFCN including IMT systems providing high data rate applications in the band 3400-3800 MHz based on a harmonised frequency arrangement will maximise the opportunities and benefits for end users and society, will benefit capital expenditure for operators, reduce development and implementation costs of manufacturing equipment and will secure future long terms investments by providing economies of scale. A harmonised frequency arrangement will reduce complexity in cross border coordination. The opportunity to utilize larger channel bandwidths will assist the provision of high data rates for IMT (especially with IMT-Advanced).

The ECC recognises that for the continuation of the successful development of MFCN including IMT, the regulatory framework needs to provide the confidence and certainty for industry to make the necessary investment. ECC recognises that administrations need flexibility to adapt their use of the bands 3400-3600 / 3600-3800 MHz to national circumstances. Any transition from legacy systems to future systems would be managed at national level. Such national measures may need to be studied (e.g. re-farming of the band, planning of renewal or extension of authorisations etc.). Moreover, the framework defined by this ECC Decision does not supersede the BWA/FWA framework. Instead, it aims at supplementing this framework to facilitate high data rate services supported by larger channel bandwidths as an evolution to the existing framework without the consequential requirement to replace systems that are based on the existing regulatory framework.

**ECC DECISION OF 9 DECEMBER 2011 ON HARMONISED FREQUENCY ARRANGEMENTS FOR MOBILE/FIXED COMMUNICATIONS NETWORKS (MFCN) OPERATING IN THE BANDS 3400-3600 MHz AND 3600-3800 MHz (ECC/DEC/(11)06)**

“The European Conference of Postal and Telecommunications Administrations,

*considering*

- a) that WRC-07 allocated the band 3400-3600 MHz to the Mobile, except Aeronautical Mobile, Service on a primary basis in a large number of countries in Region 1 subject to provisions of RR 5.430A;
- b) that RR 5.430A also identifies the 3400-3600 MHz band for IMT;
- c) that the 3400-3500 MHz and 3500-3600 MHz bands have been allocated to the Mobile Service and identified for IMT in some countries of Region 3 (RR 5.432A, 5.432B and 5.433A);
- d) that the 3500-3600 MHz band is allocated to the Mobile, except Aeronautical Mobile, Service on a primary basis in Region 2, and that the 3400-3500 MHz band is allocated on a primary basis to the Mobile, except Aeronautical Mobile, Service in some countries of Region 2 and to the Mobile Service on a secondary basis in the rest of Region 2;
- e) that the 3600-3800 MHz band is allocated to the Mobile Service in Region 1 on a secondary basis in the Radio Regulations and not identified for IMT;
- f) that in the European Table of Frequency Allocations (ERC Report 25) the major use or major interest in CEPT member countries in the 3400-3800 MHz band is the Mobile Service on a primary basis;
- g) that “mobile/fixed communications networks” (MFCN) for the purpose of this Decision includes IMT and other communications networks in the mobile and fixed services;
- h) that IMT covers both IMT-2000 and IMT-Advanced, as defined in Resolution ITU-R 56 (Naming for International Mobile Telecommunications);
- i) that detailed specifications of IMT radio interfaces are described in Recommendation ITU-R M.1457 for IMT-2000 and a new Recommendation ITU-R M. IMT.RSPEC is under development for IMT-Advanced;
- j) that a harmonised frequency arrangement facilitates economies of scale resulting in the availability of affordable equipment;
- k) that the designation of a frequency band for a specific application does not prevent the designation of the same frequency band for other applications;
- l) that the bands 3400-3600MHz and 3600-3800 MHz are allocated to the Fixed-Satellite Service (space-to-Earth) on a primary basis in the Radio Regulations and are used in some CEPT countries for that service;
- m) that the band 3400 MHz to 3410 MHz is identified in ERC Report 25 for airborne radars;
- n) that in some CEPT countries the band 3400 MHz to 3410 MHz is not available for MFCN due to use by land, airborne and naval military radars;
- o) that the use of the band 3400-3600 MHz and the band 3600-3800 MHz for Fixed Satellite Service (FSS) varies between these frequency bands. The band 3600-3800 MHz is used for FSS more heavily than the band 3400-3600 MHz;

- p) 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 of MFCN within the bands 3400- 3600 MHz and 3600-3800 MHz;
- q) that ECC Decision (07)02 designates spectrum “for BWA deployment within the band 3400-3600 MHz and/or 3600-3800 MHz, subject to market demand and with due consideration of other services deployed in these bands” and will be subject to a review by 2012;
- r) that ECC Recommendation (04)05 provides “guidelines for accommodation and assignment of multipoint fixed wireless systems in frequency bands 3.4-3.6 GHz and 3.6-3.8 GHz”;
- s) that in some CEPT countries parts of the bands 3400-3600 MHz and/or 3600-3800 MHz are already used for BWA, FWA and IMT systems;
- t) that global roaming is facilitated by common frequency arrangements and measures for free circulation for IMT terminals;
- u) that wider channel bandwidths such as 10, 20 and 40 MHz or more that could be accommodated in the bands 3400-3600 MHz and 3600-3800 MHz will enable higher data rates;
- v) that spectrum licensed for MFCN is generally assigned in multiples of 5MHz, except where this is not possible, e.g. due to the presence of existing users;
- w) that measures might be needed to ensure coexistence between unsynchronized TDD networks in adjacent blocks (e.g. additional filtering, site coordination, restricted blocks/guardbands);
- x) that in case of TDD networks in the same geographical area, it may be beneficial to synchronise them (frame timing and/or uplink/downlink timeslot ratio) or add filtering to base stations, to improve the efficient usage of spectrum by avoiding restricted blocks/guardbands between their networks; an advantage of TDD compared to FDD is to have a freedom to adjust the uplink/downlink ratio, however, aligning the uplink/downlink timeslot ratio requires agreement between the involved network operators and may thus reduce their freedom to adjust the uplink/downlink ratio to respond to traffic demand;
- y) that the synchronisation of TDD networks of different operators can be managed at national level (e.g. voluntary agreement between operators or national regulatory measures);
- z) that studies on sharing between IMT and the Fixed Satellite Service have been carried out by ITU-R, (see Report ITU-R M.2109);
- aa) that TDD allows more efficient spectrum use when taking into account existing fixed satellite usage in case of geographical sharing;
- bb) that in some CEPT countries, the deployment of networks will need a bilateral agreement concerning the use of stations in the mobile service in one country and stations of other primary services in a neighbouring country (e.g. Earth stations of the fixed satellite service) (see RR 5.430A for the band 3400-3600 MHz);
- cc) that in EU/EFTA countries the radio equipment that is under the scope of this 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;
- dd) that a separate ECC Report is planned covering measures to facilitate coexistence between adjacent TDD networks (e.g. synchronisation, additional filtering, site coordination, restricted blocks/ guardbands);
- ee) that the FDD frequency arrangement needs further specification work in order to define the potential for harmonised usage of the duplex gap;
- ff) that sharing studies between FDD and TDD are necessary;

- gg) that although there are licensed paired frequency arrangements in many CEPT countries, TDD systems are currently used in a number of those countries in the band 3400 - 3600 MHz due to the better availability of TDD systems;
- hh) that TDD may allow more flexible accommodation of current use of the frequency bands by other services.

### DECIDES

1. that CEPT administrations shall designate the frequency bands 3400-3600 MHz and 3600-3800 MHz on a non-exclusive basis to mobile/fixed communications networks (MFCN), without prejudice to the protection and continued operation of other existing users in these bands;
2. that administrations wishing to implement MFCN (including IMT) in the 3400-3600 MHz band should follow the harmonised frequency arrangement given in Annex 1 (TDD) or the harmonised frequency arrangement (taking into account considering ee) above) given in Annex 2 (FDD);
3. that the frequency arrangement in the 3.4 - 3.6 GHz should be subject to review no later than end 2013 with the aim to identify a preferred frequency arrangement;
4. that administrations wishing to implement MFCN (including IMT) in the 3600-3800 MHz band should adhere to the harmonised frequency arrangement given in Annex 3 (TDD);
5. that administrations should consider facilitating the migration of existing terrestrial networks and authorisations to the frequency arrangements described in the Annexes;
6. that this Decision enters into force on 9 December 2011;
7. that the preferred date for implementation of the Decision shall be 30 June 2012;
8. that CEPT administrations shall communicate the national measures implementing this Decision to the ECC Chairman and the Office when the Decision is nationally implemented.”

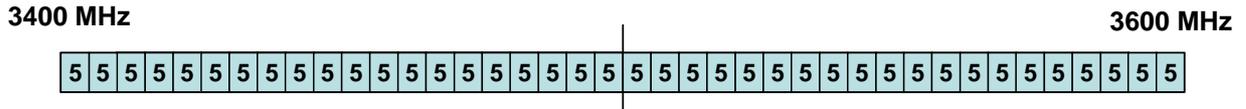
### Note:

*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: FREQUENCY ARRANGEMENT FOR THE 3400-3600 MHz BAND BASED ON TDD**

The frequency arrangement is a TDD arrangement, based on a block size of 5 MHz starting at the lower edge of 3400 MHz.

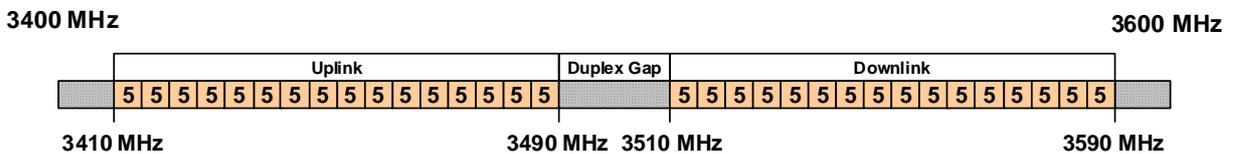
If blocks need to be offset to accommodate other users, the raster should be 100 kHz. Narrower blocks can be defined adjacent to other users, to allow full use of spectrum. It has to be noted that TDD in one extreme case also covers downlink only operation.



**ANNEX 2: FREQUENCY ARRANGEMENT FOR THE 3400-3600 MHz BAND BASED ON FDD**

The frequency arrangement is an FDD arrangement, based on a block size of 5 MHz starting at the lower edge of 3410 MHz. The sub-band 3410-3490 MHz is used for the uplink, the sub-band 3510-3590 MHz is used for the downlink. The resulting duplex gap is 20 MHz (3490-3510 MHz).

If blocks need to be offset to accommodate other uses, the raster should be 100 kHz. Narrower blocks can be defined adjacent to other users, to allow full use of spectrum.



**ANNEX 3: HARMONISED FREQUENCY ARRANGEMENT FOR THE 3600-3800 MHz BAND BASED ON TDD**

The frequency arrangement is a TDD arrangement, based on a block size of 5 MHz starting at the lower edge of 3600 MHz.

If blocks need to be offset to accommodate other uses, the raster should be 100 kHz. Narrower blocks can be defined adjacent to other users, to allow full use of spectrum. It has to be noted that TDD in one extreme case also covers downlink only operation.

