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JPTBWA(06)128

## **ELECTRONIC COMMUNICATIONS COMMITTEE**

ECC Decision  
of [dd] [month] 2006  
on availability of frequency bands between 3400-3800 MHz  
for the Harmonised implementation of  
**Broadband Wireless Access** systems  
(BWA)

(ECC/DEC/(06)[xx])



## EXPLANATORY MEMORANDUM

### INTRODUCTION

This CEPT/ECC Decision addresses the availability of frequency bands between 3400-3800 MHz for the harmonised implementation of **Broadband Wireless Access** systems (BWA). These frequency bands are allocated to the fixed service on a primary basis and to the mobile service on a secondary basis in ITU Region 1.

Broadband Wireless Access ("BWA") is a descriptive term for the wireless delivery, mainly but not exclusively to an end user, of broadband traffic that can encompass fixed, nomadic and mobile applications. It is also considered that BWA systems might include backhauling services for the same or a second operator.

Results of CEPT/ECC studies clearly identify the band 3 400-3 600 MHz as the widest available choice for current and future BWA deployment in CEPT. The band 3 600-3 800 MHz has been identified as a possible additional or alternative frequency band. On the basis of a survey undertaken by ERO in 2005, updated in 2006, a clear majority of European countries indicated that they already use the 3.5 GHz band for FWA. In addition, it was also indicated in that survey the use of the 3.7 GHz band for Wireless Access purposes was at that time limited to a few European countries.

To prepare the harmonisation of the frequency bands 3 400-3 600 MHz and 3 600-3 800 MHz for BWA, the following sharing considerations have already been carried out:

- The intra-service sharing (i.e. coexistence rules for two BWA systems/cells of different operators) was originally addressed in ECC Report 33 (February 2006) for FWA/NWA deployment. The subsequent studies of mobile usage mode (MWA) were based on certain assumptions that included un-coordinated deployment as well as possible concentration of users (with active user density representative of BWA scenarios) in indoor environment. These studies indicated that a guard band of around one channel might be needed between MWA TS-TS, which is understood to be implicitly provided by CS Block Edge Mask requirements.
- The inter-service sharing of BWA vs. other systems and/or services in the 3.4–3.8 GHz band. The other systems and/or services considered in this study are ENG/OB (Electronic News Gathering and Outside Broadcasting), Fixed Point-to-Point links, Fixed-Satellite Service (Space-to-Earth) and Radiolocation Service (primary allocation below 3.4 GHz and secondary allocation above 3.4 GHz). The results of these studies are contained in ECC Report 100. This Report provides guidance for Administrations on co-ordination between BWA and other systems / services in the band, the details of the coordination depending upon the other systems/services characteristics and the BWA characteristics and usage mode. This includes guidance for co-channel sharing scenarios as well as for some adjacent compatibility cases, such as the impact from BWA operation in the 3.4-3.6 GHz band into FSS earth station receivers operating above 3.6 GHz.

### BACKGROUND

In 1998 the band 3.4-3.6 GHz was identified as a preferred frequency band for Fixed Wireless Access (FWA) (ERC/REC13-04, ERC/REC14-03, ERC Report 25 refer). The band 3.6-3.8 GHz is also used in some CEPT countries for multipoint Fixed Wireless systems in accordance with provisions of ERC/REC 12-08. Consequently, many CEPT administrations have already delivered FWA licences to operators in order to provide Fixed Wireless applications. These authorisations are more often, technological neutral and provide flexibility and freedom for operators to choose the best use of the spectrum for Fixed applications. Any modification of the use of the spectrum, especially on the usage mode, shall be analysed in terms of compatibility and general policy for the licensed band.

During recent years the broadband connectivity has been increasing in Europe dramatically, boosted by the demand for high speed access to the Internet, large volume e-mailing, video and audio streaming and file sharing and further innovative multimedia services. The prospects of BWA take up have been changing recently after the consolidated industry efforts resulted in development of open inter-operability standards and new modulation technologies, allowing to overcome the line-of-sight requirements, hence allowing deployment of easy-to-install indoor user terminals. Recognising this ever increasing demand for broadband connectivity and the improved prospects of radiocommunication systems in satisfying these demands in a most universal way, the ECC has studied the advantages and disadvantages of the development of a regulatory framework for BWA in the frequency band 3 400-3 800 MHz.

BWA systems are expected to be mainly deployed in all usage modes Fixed Wireless Access (FWA), Nomadic Wireless Access (NWA) and Mobile Wireless Access (MWA), where the Central Stations (CS) will be at a fixed location, while Terminal Stations (TS) will be deployed in a ubiquitous way. This Decision did not consider MultiPoint to MultiPoint (Mesh) architectures. Therefore further studies might be necessary in order to verify the applicability of this Decision for MP-MP (Mesh) systems subject to market availability of such systems.

It should be noted that terminal stations may use either directional or omni directional antenna. It is assumed that for Fixed and Nomadic use the vast majority of terminal stations using omni directional antennas will be operated indoor, this may not necessarily be the case for Mobile use.

The more traditional authorisation approach required the regulator to make decisions between the service definitions identified for each particular frequency band within an allocation table (e.g. ECA). This then required the regulator to define specific operating conditions. These conditions were required to manage the interference potential for the specific usage mode (e.g. Fixed and Mobile). Therefore, this may have meant that not all of the usage modes would be permitted. In some CEPT countries there has already been a move towards spectrum authorisations which allow operators flexibility in the manner in which networks are deployed and configured. These are spectrum block geographical area authorisations. This is where the operator is given authorisation for a defined area, rather than defining the operating conditions (e.g. transmitter specific location, specific bandwidth etc.). In this regime it could be possible, depending on the national situation, to give to the operators the flexibility to determine the usage mode. However it has to be acknowledged, that the need for managing the different interference potential related to the specific usage mode might result in limiting this additional flexibility, or in different constraints for the use of some modes.

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

The allocation or designation of frequency bands for use by a service or system under specified conditions in CEPT administrations is laid down by law, regulation or administrative action. ECC Decisions are required to deal with the radio spectrum related matters and for the carriage and use of equipment throughout Europe. The harmonisation on an European basis supports the *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*. A commitment by CEPT administrations to implement an ECC Decision will provide a clear indication that the required frequency bands will be made available on time and on an European-wide basis.

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of [dd] [month] 2006**

**on availability of frequency bands between 3400-3800 MHz  
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"The European Conference of Postal and Telecommunications Administrations,

*considering*

- a. that the frequency bands 3 400-3 600 MHz and 3 600-3 800 MHz are allocated to the fixed service and to the fixed-satellite service (space-to-Earth) on a primary basis in ITU Region 1;
- b. that the bands in considering "a" are allocated to the mobile service on a secondary basis and the band 3 400-3 600 MHz is also allocated to the radiolocation service on a secondary basis in ITU Region 1;
- c. that definitions of BWA (Broadband Wireless Access) applications encompassing FWA (Fixed Wireless Access), NWA (Nomadic Wireless Access), MWA (Mobile Wireless Access) can be found in Recommendation ITU-R F.1399;
- d. that within the European Common Allocation Table (ECA) the frequency band 3 400-3 800 MHz is also allocated on a primary basis to the mobile service;
- e. that the ECA indicates the major co-primary use of the band 3400 – 3600 MHz for BWA and coordinated SAP/SAB applications for occasional use;
- f. that the ECA indicates the major co-primary use of the band 3600 – 3800 MHz for BWA, medium/high capacity Fixed links and FSS applications;
- g. that the band 3400 – 3600 MHz is identified as a preferred frequency band for FWA (ERC/REC13-04, ERC/REC14-03 refer);
- h. that the band 3600 – 3800 MHz is also used in some CEPT countries for multipoint Fixed Wireless systems in accordance with provisions of ERC/REC 12-08;
- i. that in some countries the band 3400 MHz to 3410 MHz is used by land, airborne and naval military radars;
- j. that radio Amateur Services are authorised in the frequency band 3400 – 3410 MHz on a secondary basis;
- k. that spectrum authorisations for BWA in the bands in considering "a", based on assignment/allotment of spectrum blocks over a defined geographical area, may allow one or more of the applications of BWA referred to in considering "c";
- l. that for spectrum authorisations for BWA in the bands in considering "a" that are assigned, by Administrations, to individual equipment (i.e. Central Stations), the conditions of use may need to be qualified to manage the technical arrangements between a number of different operators;
- m. that for an efficient introduction of BWA in the frequency bands identified in considering "a", administrations will have to consider an appropriate co-ordination regime, e.g. licensing on a regional, local area or on an individual equipment basis, that takes in to account the extent of the use of these bands by other systems or services (e.g. FSS, Point-to-Point FS, etc);
- n. that in general, if suitable separation distance is set up between BWA central stations and other systems the impact of BWA terminal stations is not significant. Therefore registration for central stations alone may be sufficient for managing sharing issues;

- o. that within the two frequency bands defined in considering “a”, if completely available, paired sub-bands 3.4-3.5 GHz / 3.5-3.6 GHz and 3.6-3.7 GHz / 3.7-3.8 GHz provide suitable frame conditions for FDD and TDD systems or a combination;
- p. that ECC Report 33 on "The analysis of the coexistence of point-to-multipoint Fixed Wireless Systems cells in the 3.4-3.8 GHz band" (February 2006) provides guidelines for efficient, technology independent deployment of 3.5 GHz and 3.7 GHz point-to-multipoint fixed wireless systems;
- q. that ECC Report 76 on "Cross-border coordination of multipoint fixed wireless systems in frequency bands from 3.4-3.8 GHz" (February 2006) addresses the issue of finding a most suitable method and criteria for cross-border coordination between point-to-point systems and multipoint fixed wireless access systems located on different sides of a national border;
- r. that ECC Recommendation (04)05 (adopted in February 2006) 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 CEPT/ECC Report 100 on "Compatibility studies in the band 3 400-3 800 MHz between Broadband Wireless Access Systems (BWA) and other services” addresses the inter-service sharing of BWA vs. other existing services/systems (point-to-point, ENG/OB, fixed-satellite service (space-to-Earth) and radiolocation service);
- t. that taking into account the availability of spectrum on a national basis, some CEPT administrations have already released spectrum within the 3.4-3.6 GHz band and may also consider providing spectrum within the 3.6-3.8 GHz band as far as compatible operation with earth stations in the fixed-satellite service (s-E) as well as with existing Point-to-point links in the fixed service is possible;
- u. that it is important to make spectrum available in order to meet an overall demand for broadband connectivity;
- v. that the identification of the bands defined in considering “a” for BWA does not preclude the future use of these bands by other systems and services to which these bands are allocated or designated;
- w. that the frequency assignment/allotment for BWA should also take into account the existing bi- or multi-lateral international agreements and general cross-border co-ordination procedures to ensure suitable protection of similar or different systems and services in neighbouring countries;

Comment [BNetzA1]: under public consultation until 15 December 2006

#### DECIDES

1. that spectrum shall be designated for BWA deployment, within the band 3 400-3 600 MHz and/or 3 600-3 800 MHz, subject to market demand and with due consideration of other services deployed in these bands;
2. that in EU/EFTA countries the use of BWA equipment in frequency bands identified in Decides 1 shall comply with the R&TTE Directive. Conformity with the essential requirements in its Article 3(2) may be demonstrated by compliance with harmonised standard(s) (e.g. ETSI EN 302 326-2) or equivalent technical specifications;
3. that administrations shall consider allowing flexible usage modes within authorised BWA deployments in the frequency bands identified in Decides 1, taking into account the considerations as described in the Annex;
4. that for the deployment of BWA networks in the frequency bands identified in Decides 1, administrations shall take into account the situation regarding the use of the frequency band in the concerned area by other services/systems (e.g. FS, FSS, ENG/OB, etc) and that coordination of the BWA central stations with the other existing services/systems may be required;
5. that this Decision enters into force on [dd] [month] 2007;
6. 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:*

- 1 The following Members have a derogation to implement this Decision until [xx yy zzzz].*
- 2 Please check the Office web site (<http://www.ero.dk>) for the up to date position on the implementation of this and other ECC Decisions.*

## Annex

### Considerations for Implementation of Flexible Usage Mode for BWA in 3400-3600 MHz and/or in 3600-3800 MHz

#### 1. Definitions

The reference to “flexible usage mode” means regulatory provisions (e.g. licence conditions), which would allow BWA licence holder to deploy various types of Terminal Stations (TS): fixed (Fixed Wireless Access - FWA), nomadic (Nomadic Wireless Access - NWA) or mobile (Mobile Wireless Access - MWA).

The detailed definitions of FWA, NWA and MWA are given in Recommendation ITU-R F.1399.

A typical example of FWA TS could be a stationary roof-top user equipment. An example of NWA TS could be a desk-top portable user equipment or laptop PC equipped with the internal BWA access card. An example of MWA TS could be a handheld user terminal.

#### 2. General considerations

When deciding on granting flexible usage mode rights to BWA licence(s), administrations shall consider following issues:

- Compliance with relevant provisions of legal instruments governing the field of radiocommunications, such as the ITU Radio Regulations, EU legislation and corresponding national telecommunications laws (i.e. national acts transposing ITU and EU acts, as well as any further sovereign regulations in the field);
- Legacy situation, e.g. consider the regulatory limitations and conditions of existing (previously issued) authorisations in the frequency bands subject to this Decision;
- Technical provisions established by existing international frequency co-ordination agreements.

#### 3. Technical considerations

As a starting point, the guidance given in ECC Recommendation (04)05 on technical conditions for implementation of flexible usage mode, to be set in the technology neutral BWA licence process, shall be considered.

Furthermore, the introduction of MWA usage mode will be subject to following additional requirements for deployment of mobile terminal stations (TS):

- a. Maximum radiated power density of 25 dBm/MHz;
- b. Minimum ATPC range of 15 dB;
- c. When blocks are assigned contiguously (without external guard bands) care should be taken not to allow a TS transmit centre frequency closer than one channel width from the block edge unless co-ordination between operators is undertaken. Co-ordination may include the application of other specific interference mitigation measures. However it is understood that such a “virtual guard channel” is implicit, under normal circumstances, through application of the CS BEM as recommended in ECC/REC(04)05.