ELECTRONIC COMMUNICATIONS COMMITTEE

ECC Decision
of 30 March 2007
on availability of frequency bands between 3400-3800 MHz
for the harmonised implementation of
Broadband Wireless Access systems (BWA)

(ECC/DEC/(07)02)
(2008/411/EC)

EXPLANATORY MEMORANDUM

1 INTRODUCTION

This CEPT/ECC Decision addresses the availability of frequency bands between 3400-3800 MHz for the harmonised implementation of Broadband Wireless Access (BWA) systems.

BWA is a descriptive term for radiocommunications systems providing wireless delivery (mainly to an end user but not exclusively) 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 3400-3600 MHz as the widest available choice for current and future BWA deployment in CEPT. The band 3600-3800 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 3400-3600 MHz band for Fixed Wireless Access (FWA). In addition, it was also indicated in the survey that the use of the 3600-3800 MHz band for wireless access systems was at that time limited to a few European countries.

To prepare the harmonisation of the frequency bands 3400-3600 MHz and 3600-3800 MHz for BWA, the following sharing considerations have been carried out:

- The intra-service sharing (i.e. co-existence 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, i.e. Mobile Wireless Access (MWA) systems, 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 for MWA Terminal Station (TS) to TS compatibility scenario, which is understood to be implicitly provided by Central Station (CS) Block Edge Mask requirements.

- The inter-service sharing of BWA vs. other systems and/or services across entire 3400–3800 MHz range. The other systems and/or services considered in this study were Electronic News Gathering and Outside Broadcasting (ENG/OB), Fixed Point-to-Point links, Fixed-Satellite Service (Space-to-Earth) and Radiolocation Service (primary allocation below 3400 MHz and secondary allocation above 3400 MHz). 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 characteristics of other systems/services and the BWA as well as BWA 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 3400-3600 MHz band into FSS earth station receivers operating above 3600 MHz.

2 BACKGROUND

In 1998 the band 3400-3600 MHz was identified as a preferred frequency band for FWA (ERC/REC13-04, ERC/REC14-03, ERC Report 25 refer). The band 3600-3800 MHz is also used in some CEPT countries for multipoint FWA 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 FWA services. These authorisations are more often technologically 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 former line-of-sight requirements for links in subject bands, hence allowing deployment of easy-to-install indoor user terminals. Recognising this ever increasing demand for broadband connectivity and the improved prospects of radiocommunications 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 3400-3800 MHz.

BWA systems are expected to be mainly deployed in all usage modes i.e. FWA, Nomadic Wireless Access (NWA) and MWA, where the CS will be at a fixed location, while TS will be deployed in a ubiquitous way. This Decision did not consider wireless access systems using Multipoint-to-Multipoint (MP-MP, also known as 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 BWA TSs may use either directional or omni-directional antennas. It is assumed that, for FWA/NWA use, the vast majority of TSs using omni-directional antennas will be operated indoors, but this may not necessarily be the case for MWA 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. European Common Allocations table in ERC Report 25). 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 that 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 to use a particular frequency block for a defined geographic area, rather than defining the operating conditions (e.g. specific location of transmitters, 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.

3 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 a European-wide basis.

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Comparable technical specifications to those given in this ECC Decision are given in Commission Decision 2008/411/EC of 21 May 2008. EU/EFTA Member States and, if so approved by the EEA Joint Committee, Iceland, Liechtenstein and Norway are obliged to implement the EC Decision.

"The European Conference of Postal and Telecommunications Administrations,

considering

a) that the frequency bands 3400-3600 MHz and 3600-3800 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 3400-3600 MHz is also allocated to the Radiolocation Service on a secondary basis in ITU Region 1;

c) that definitions of Broadband Wireless Access (BWA) applications encompassing Fixed Wireless Access (FWA), Nomadic Wireless Access (NWA), and Mobile Wireless Access (MWA) can be found in Recommendation ITU-R F.1399;

d) that the European Common Allocation Table (ECA) specified in ERC Report 25 foresees an allocation in the frequency band 3400-3800 MHz on a primary basis to the Mobile Service, recognising that in some countries the status of the Mobile Service may be secondary;

e) that the ECA indicates the major co-primary utilisation of the band 3400-3600 MHz for BWA applications and coordinated SAP/SAB applications for occasional use;

f) that the ECA indicates the major co-primary utilisation of the band 3600-3800 MHz for BWA, medium/high capacity Fixed Service links and FSS applications;

g) that the band 3400-3600 MHz has been identified as a preferred frequency band for FWA (ERC/REC 13-04, ERC/REC 14-03 refer);

h) that the band 3600-3800 MHz has been also used in some CEPT countries for multipoint FWA 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 FSS earth stations are operated in the bands 3400-3600 MHz and 3600-3800 MHz, especially above 3700 MHz;

k) that Radio Amateur Services are authorised in the frequency band 3400-3410 MHz on a secondary basis;

l) 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”;

m) that for spectrum authorisations for BWA in the bands in considering “a” that are given by Administrations to individual equipment, i.e. Central Stations (CS), the conditions of use may need to be qualified to manage the technical arrangements between a number of different operators;

n) 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);

o) that in general, if suitable separation distance is set up between BWA CS and other systems the impact of BWA Terminal Stations (TS) is not significant. Therefore registration of CSs alone may be sufficient for managing sharing issues;

p) that within the two frequency bands defined in considering “a”, if both bands completely available for BWA, pairing of sub-bands 3400-3500/3500-3600 MHz and 3600-3700/3700-3800 provide suitable frame conditions for Frequency Division Duplex (FDD) and Time Division Duplex (TDD) systems or their combination;

q) 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 FWA systems;

r) that ECC Report 76 on "Cross-border coordination of multipoint fixed wireless systems in frequency bands from 3.4-33.4 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 FWA systems located on different sides of a national border;

s) that ECC Recommendation (04)05 (adopted in February 2006) provides “Guidelines for accommodation and assignment of multipoint fixed wireless systems in frequency bands 3400-3600 MHz and 3600-3800 MHz”;

t) that ECC Report 100 on ”Compatibility studies in the band 3400-3800 MHz between Broadband Wireless Access Systems (BWA) and other services” addresses the inter-service sharing and adjacent band compatibility of BWA vs. other existing services/systems (point-to-point, ENG/OB, fixed-satellite service (space-to-Earth) and radiolocation service);

u) that taking into account the availability of spectrum on a national basis, some CEPT administrations have already released spectrum within the 3400-3600 MHz band and may also consider providing spectrum to BWA within the 3600-3800 MHz 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;

v) that it is important to make spectrum available for BWA in order to meet an overall demand for broadband connectivity;

w) 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;

x) 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 as given in ITU Radio Regulations to ensure suitable protection of similar or different systems and services in neighbouring countries;

y) 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;

DECIDES

1. that spectrum shall be designated 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;

2. 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;

3. that for the deployment of BWA networks in the frequency bands identified in Decides 1, administrations shall take into account the in-band and adjacent band compatibility with other services/systems (e.g. FS, FSS, ENG/OB, etc) and as a result, coordination of the BWA CS with existing services/systems may be required in the concerned area;

4. that this Decision enters into force on 30 March 2007;

5. that the preferred date for implementation of this Decision shall be 01 July 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:
Spain until 31 December 2012

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 TSs: 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 mobileTS:

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 Block Edge Mask as recommended in ECC/REC(04)05.