

## Response to the public consultation regarding Fixed Wireless Access (FWA)

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### Acknowledgements

ICP would like to thank all those entities which responded to the public consultation regarding Fixed Wireless Access (FWA), from those who declared an interest in integrating such systems within their networks to those who took the opportunity to share their knowledge and vision concerning the issue in question.

#### 1. Introduction

In the ambit of the preparation of the telecommunications market for liberalisation of the fixed telephone service in January 1, 2000, ICP launched a public consultation for declarations of interest regarding FWA. This initiative aims to promote new services and technological platforms in recognition of the importance of local access for the supply of new telecommunications services in the best possible economic conditions.

In the present context of frequency assignment, FWA involves radio connections. Point-multipoint connections (P-MP) are a strong priority.

This system is understood as a means of access to a public telecommunications network, and as such forms an integral part of this network, although not associated to any specific content.

Frequency assignment for FWA will be limited at present to those operators who aim to complement their network infrastructures, specifically those of a fixed nature, with new means of local access via radio. The present document provides a general summary of the opinions of all those who responded to the public consultation process, and also describes the implementation plan adopted by ICP for the assignment of FWA licenses.

#### 2. Results of the consultation process

The consultation process for the declaration of interest regarding Fixed Wireless Access took place between March 5 and April 9, with 25 responses including telecommunications operators, equipment suppliers and other interested parties.

Entities	
CABOVISÃO	SEC
COMNEXO	SRD
E3G	TELECEL
ESOTERICA	TELEPAC
Eunet	TMN

FINANTEL	UNIVERTEL
FirstMark	WTS
HLC	ALCATEL
MAXITEL	ERICSSON
OPTIMUS	LUSIS (INNOWAVE)
PARTIFEL	TELEDESIC
Portugal Telecom	Respostas em nome individual

The responses from telecommunications operators can be classified according to the type of services they provide, specifically voice, data, cable television and mobile communications.

Analysis of the responses reveals the following:

- The market players segment different types of service according to the following frequency bands:
  - The 3,5 GHz band for applications such as vocal telephony and low-debit data (below 2 Mb ps);
  - The 26 GHz bands for wideband applications (e.g. Internet access, high-debit data (above 2 Mb ps), video (video-telephony and video-conferencing) and distribution of television broadcasts).
- The various interested parties revealed a wide diversity of spectrum requirements (although these statements lacked solid foundations given the lack of data for such systems).
- Spectrum requirements in the frequency band, 26 GHz, vary widely. This is due to the interest in using FWA for the distribution of television broadcasts, with certain entities estimating that 1000 MHz was the minimum spectrum requirement while other respondents identified spectrum requirement below 100 MHz for other applications.
- Land Mobile Service operators demonstrated their interest in using these bands for links between controllers (BSC) and base stations (BTS).
- The responses do not identify the requisites for co-existence of several FWA users - frequency band sharing using the same or different technology, nor the safety bands needed between various types of FWA use..
- In relation to the existence of other frequency bands of technologies which may be used in local access, interest was also declared for the use of DECT in the 1880-1900 MHz band, and the 40,5 - 43,5 GHz band, already indicated for MWS (*Multimedia Wireless Systems*).

### **2.1 - Minimum spectrum requirements**

One of the principal objectives of the public consultation process was to learn of spectrum requirements for the development of FWA systems. The overall conclusion of the responses, although lacking solid foundations, revealed that the spectrum available is insufficient to satisfy all interested parties.

The following table illustrates the responses corresponding to the frequency bands identified in the public consultation with mention of spectrum requirements (in MHz).

Bands	3 400 - 3 600 MHz	24,5-26,5 GHz
Interested Parties		
A	2 x 28	2 x 56
B	2 x 42	2 x 252
C		2 x 80
D		1000
E	2 x 28	2 x 56
F	2 x 50	2 x 56
G		2 x 100 to 250
H	2 x 28	2 x 56
I		2 x 112
J	2 x 28+10	2 x 56+28
L	2 x 25	
M	2 x 28	2 x 112
N		2 x 28
O		1000
P		1000
Q		2 x 56+28
R	2 x 21	2 x 100

Declarations of interest were also made for the following frequency bands:

- 1900 MHz (DECT);
- 10 GHz;
- 29 GHz;
- 31 GHz;
- 40 GHz (MWS).

## 2.2 - Technologies

The responses to the public consultation revealed a diversity of technologies, mainly due to the absence of a single standard for FWA systems.

As a result, any technology based on CDMA, TDMA or FDMA was accepted provided that it complied with the terms established in the ETSI standards applicable to FWA frequency bands, except the 1880 - 1900 MHz band where only DECT may be used.

Despite the fact that the planning of those frequency bands subject to tender will be principally for use of P-MP systems with frequency duplex division (FDD), it is also possible to use time duplex division (TDD) within FWA systems.

In order to establish compatibility for this operation without a reduction in service quality it may be necessary to create safety bands between adjacent blocks. This spectrum would then have to be included within the frequency assigned to each entity. In this manner, the solution of any eventual interference should be agreed between the parties involved.

### **3. Implementation Plan**

In the ambit of liberalisation of the fixed telephone service and in order to promote new services and technological platforms the following frequency bands will be made available from January 1, 2000:

- 1900 MHz with the use of DECT technology;
- 3600 - 3800 MHz for point-multipoint systems;
- 24,5 - 26,5 GHz for point-multipoint systems;
- 27,5 - 29,5 GHz for point-multipoint systems.

In order to conciliate declarations of interest and the public interest, spectrum will be assigned in such a manner as to ensure that spectrum use in Portugal offers greater liberty in the development of operational and business plans and will also maximise efficient spectrum utilisation. The latter is particularly important for co-ordination between various forms of spectrum use at the national level.

Consideration will be made over the medium term of technological developments, compatibility studies and effective use of the assigned spectrum. In this manner, periodic updating is possible of utilisation licenses, in order to adapt geographic extension to operator needs in the ambit of the business plans which operators aim to develop.

In the present context of frequency assignment, FWA involves radio connections, but point-multipoint connections (P-MP) are a strong priority.

This system is understood as a means of access to a public telecommunications network, and as such forms an integral part of this network, although not associated to any specific content.

Frequency assignment for FWA will be limited at present to those operators who aim to complement their network infrastructures, specifically those of a fixed nature. Consideration will not, therefore, be made of the possible introduction of "FWA operators".

The 27,5 - 29,5 GHz band will be made available principally for applications involving the distribution of television broadcasts.

The taxes applicable to spectrum utilisation for FWA will be integrated within a general revision of tariff policy. The responses received confirmed that principles of spectrum taxation should include frequency bands, associated bandwidth and geographic area of utilisation.

#### ***3.1 - 1880- 1900 MHz Band with utilisation of DECT technology***

The general conditions for assignment of this band are:

- Possession of a Public Telecommunications Network Operator License or a corresponding request under evaluation by ICP;
- Utilisation of FWA as an extension of this network that includes other signal transport infrastructures intended to supply services to end-users.

This band may not be used as a complement to mobile communications systems.

Frequencies will be assigned under a regime of full access.

### **3.2 - 3600- 3800 MHz Band**

The 3400 - 3600 MHz band had initially been indicated for the use of FWA systems, but it has been shown that conditions do not yet exist to guarantee interference-free operation of such systems, given that spurious emissions were detected in this band deriving from systems operating in adjacent bands.

It was therefore decided to make available the 360 - 3800 MHz band in this stage, because although this is not one of the ideal bands for FWA systems, it has been identified by CEPT and ITU -R as a possible extension band. 3 blocks of 2 ˆ 28 MHz may be assigned, but a single entity may not use more than one block. The channelling chosen for this band is CEPT/ERC/REC. 12-08 Annex B, with 100 MHz duplex separation. The general conditions for assignment of this band are:

- Possession of a Public Telecommunications Network Operator License or a corresponding request under evaluation by ICP;
- Utilisation of FWA as an extension of this network that includes other signal transport infrastructures intended to supply services to end-users.

Use of the band as a support for a transmission network is not permitted. Frequencies will be assigned by public tender.

### **3.3 - 24,5 - 26,5 GHz Band**

Licenses in this band will be granted in 2x56 MHz blocks, with one block available per entity.

The channelling adopted for this band is that of Recommendation T/R 13-02 Annex B, with 1008 MHz duplex separation. At present, 6 blocks of 2x56 MHz will be made available. The rest of the available spectrum will be reserved for future assignment.

The general conditions for assignment of this band are:

- Companies registered in ICP for the provision of Public Use Telecommunications Services;
- Utilisation as extension or integral part of a network that includes other signal transport services intended to supply services to end-users.

Frequencies will be assigned by public tender.

### **3.4 - 27,5 - 29,5 GHz Band**

Licenses in this band will be granted in 2x175 Mhz blocks, with one block available per entity.

The channelling adopted for this band is that of Recommendation T/R 13-02 Annex C, with 1008 MHz duplex separation. At present, 2 blocks of 2x175 Mhz will be made available.

The general conditions for assignment of this band are:

- Companies registered in ICP for the provision of Public Use Telecommunications Services;
- Utilisation as extension or integral part of a network that includes other signal transport services intended to supply services to end-users.

Frequencies will be assigned by public tender.

### **3.5 - 40,5 - 43,5 GHz Band**

The 40,5-43,5 GHz Band will be made available in a second stage, in function of the level of competition resulting from the four preceding bands and technological developments permitting use of this band.

## **4. SUMMARY TABLE**

Stages	Assignment principle	Frequency Band	Available Spectrum
Stage 1	Full access	1880-1900 MHz (DECT)	20 MHz (shared use)
	Public Tender	3600 - 3800 MHz	3 blocks of 2 x 28 MHz
	Public Tender	24,5 - 26,5 GHz	6 blocks of 2 x 56 MHz
	Public Tender	27,5 - 29,5 GHz	2 blocks of 2 x 175 MHz
Stage 2	To be defined	40,5-43,5 GHz	To be defined