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To:

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Public consultation on Broadband Wireless Access

A response from Samsung Electronics UK, to the ICP-Anacom invitation for comments.

Introduction

Samsung Electronics UK is the European base for Samsung Electronics, a leading manufacturer of domestic and business electronic products including leading edge telecommunications wireless products. Samsung has a keen interest in broadband wireless access developments around the world and plays a major role on the WiMAX Forum Board and in the working groups. Samsung has been leading the development of mobile WiMAX through the introduction of the WiBRO (Wireless BROadband) service in Korea which is a specific application based on the IEEE802.16e-2005 standard. In addition recent announcements of collaboration with a major operator in the US have highlighted Samsung's commitment to mobile WiMAX in the 2.5GHz band.

Therefore Samsung is pleased to respond to the ICP-Anacom consultation regarding Broadband Wireless Access (BWA) in Portugal.

Samsung Electronics UK responses:

General Comment

Samsung Electronics notes the specific nature of the consultation concerning BWA in the 3.5GHz and 5.8GHz frequency bands. Samsung recognises that the specific focus of recent ECC activity and the European Commission mandate on BWA has been on

these frequency ranges. However Samsung is also aware that there is a strong interest in the possibility for BWA in the 2500-2690MHz range. Although this frequency range has been designated for IMT-2000/UMTS technologies by ECC Decision (05)05 there remains scope for other technologies to gain access to these frequencies and indeed some administrations are already advocating technology neutral licensing in this frequency range too. Within ETSI there is a draft EN302 544 under development in TC BRAN for technologies in this frequency range other than UMTS. Samsung Electronics requests that ICP-Anacom also consider this important frequency range that offers good possibilities for world-wide availability and roaming.

Response to the specific questions:

1. BWA Framework

a) Define and describe the technologies covered by BWA, indicating positive aspects and possible fragilities.

Although several proprietary technologies exist for FWA in the 3.5GHz band, Samsung Electronics is only aware of one current standardised technology based on the IEEE802.16 standards and supported by the certification activities of the WiMAX Forum. This technology supported by the WiMAX Forum offers the opportunity for widely available, multiple source, interoperable equipment that will especially encourage portable and nomadic services that are attractive to consumers. In the past, regulatory insistence on “fixed – only” deployments in these frequencies has constrained the business case for wireless technology. The new possibility for nomadic and mobile terminals will enhance the attractiveness of this technology.

b) Define the radio parameters of the technologies mentioned above, including:

i. Power;

Typical Base Stations would operate at power levels between 36 and 43dBm. Terminal and portable devices would operate at maximum power levels between 20 and 26dBm.

ii. Channels;

Operating channel widths will be in the range 5 to 10MHz and WiMAX Forum certification profiles support this range.

iii. Duplex mode (TDD/FDD);

TDD mode is increasingly the preference. Samsung Electronics supports the TDD mode and this is a preference within the WiMAX Forum certification profile set for mobile BWA.

iv. Modulation;

The WiMAX Forum supports IEEE 802.16 technology based upon OFDM techniques. This can be implemented using a variety of sub-carrier modulation complexities covering BPSK to 64-QAM.

v. Standard applicable (if existing);

IEEE802.16-2004 and the revision IEEE802.16e-2005.
ETSI HIPERMAN

vi. Coexistence of various technologies and variations of the same technology;

Samsung Electronics would not expect an operator to deploy multiple technologies within a single licence assignment but with suitable spectrum management guidance operators can deploy alternate technologies (or even the same technology using different specific characteristics) in adjacent blocks. Samsung Electronics is aware of the technology neutral measures recommended in ECC Recommendation (04)05 that can facilitate coexistence.

c) What type of use is best suited to BWA technologies: connection to end user, transmission network or both?

BWA technologies can support direct end-user access but may also facilitate backhaul applications supporting, for example Local Area Networks. Standardised IEEE/WiMAX BWA technology offers features that are suited to these applications offering scheduled operation enabling QoS.

d) What types of service could be offered by each technology? Please explain in concrete terms the amount of spectrum needed to provide these services and the capabilities of the identified technologies.

IEEE/WiMAX technology offers QoS assured data services that may drive any number of specific applications. These could include real time streaming and gaming or non-real time high speed large file transfer offering entertainment downloads or facilitating tele-commuting / VPN services. Estimating the required amount of spectrum can be a difficult and uncertain task that is heavily dependant upon the specific services delivered. However, Samsung Electronics believes that BWA services should be clearly differentiated from existing wired services, therefore spectrum assignments of around 2 x 25MHz per operator are encouraged in order to encourage a truly broadband experience for the user.

e) What is the target market and how big is the market envisaged for the technologies/services offered?

Samsung Electronics believes there is a large and increasing demand for ever higher connection speeds associated with increasing mobility. Increasingly, consumers are expected to become sources of information rather than just consumers of information. Home networks are expected to increase and consumers will demand reliable connectivity with their "home" systems when remote.

2. Frequency Use

a) What comments do you have on the content of the CEPT/ECC decision and recommendation in Annex?

Samsung Electronics supports the content of the draft 3.5GHz ECC Decision and especially the increased flexibility proposed for usage mode (fixed/nomadic/mobile).

b) Under what conditions do you consider that an operator authorised to operate FWA in the 3.5 GHz and/or 24.5 GHz or 27.5 GHz bands could expand their services, changing their current technology to use BWA technology?

To support standardised/WiMAX services, new installations would be required in the 3.5GHz band.

c) Which frequency bands do you consider suitable for the provision of BWA, taking into account such factors as international harmonisation, the state of technological development and the costs involved, the type of authorisation (with waiver or not of radio license), as well as the need for coexistence with other technology systems? Please state reasons.

Samsung Electronics considers the following bands suitable with the highest priority first:

2500-2690MHz – this band is already available in a number of regions for BWA services. Therefore it represents a good opportunity for global harmonisation and all that offers in terms of roaming and economies of scale. Certification of WiMAX systems will commence in 2007 and Samsung Electronics encourages ICP-Anacom to consider technology neutral BWA licensing in this band as soon as possible.

3400-3800MHz – this range also offers good opportunities for global harmonisation (with some notable exceptions) but increased propagation factors make it less attractive for the time being for truly mobile services. This may change in the future as developments for IMT-Advanced mature.

2300-2400MHz – this range also offers an improved propagation environment however although it is a popular choice in some Asia/Pacific areas, in Europe there seems little effort or interest in developing this frequency range for BWA.

In addition there is growing interest in the opportunities that may arise from lower frequencies released for BWA resulting from the Digital Dividend. These would be particularly interesting for extended coverage in rural areas.

BWA implementation in Portugal

a) Do you consider that access to BWA frequencies should be restricted to certain bodies? If so, please indicate which ones, and give reasons who you consider it necessary to put such restrictions in place.

Samsung Electronics has no specific view on this topic.

b) Do you consider that BWA services should be offered nationwide or would it be more suitable to limit them geographically (in which case please give details of the geographic location(s) you consider the service should be limited to)

Samsung Electronics believes that greater usage mode flexibility will act as catalyst for new broadband services that consumers will expect to be available on a widespread basis. Therefore Samsung believes that national networks should be encouraged in order to maximise this opportunity and provide the economies of scale for a nationwide roll out.

c) What type of procedures do you consider most suitable for the allocation of rights/selection criteria for BWA systems in the bands mentioned in the Annexes?

Samsung Electronics has no comment concerning award procedures.

d) What type of requirements, as regards coverage obligations, quality of service, interoperability or other, do you consider should apply to usage rights?

Samsung Electronics has no specific comment concerning usage rights but encourages the minimum of binding requirements combined with flexibility in both the licensing regime (for example, allowing spectrum trading) and the licensing conditions so as not to unnecessarily restrict or constrain opportunities for new services.

e) Do you consider that BWA services will complement or coincide with other existing or future technologies (in operation or planned) in the same or other frequency bands?

Samsung Electronics believes that BWA services can complement other technologies especially 3G/UMTS services and WiFi services. It can fill the gap between high data rate local area services and the wider coverage of 3G/UMTS networks. In the longer term it is anticipated that access technologies will converge as the industry moves towards “4G” evolution and IMT-Advanced technologies. Already the IEEE has chartered a new project 802.16m to start development of IMT-Advanced standardisation.

4. Introduction of BWA systems in the market

a) What conditions do you consider important for the successful implementation of BWA technologies?

Samsung Electronics believes that licensing and technical conditions should not constrain the ability for BWA to deliver a truly broadband and differentiated service compared to traditional fixed/wired delivery methods.

b) When do you consider that BWA technologies will have the necessary conditions for successful implementation in the Portuguese market?

Mobile WiMAX technology features scalability and therefore adaptability to address both high density and low density markets. WiMAX certification of the

first mobile systems will commence in early 2007 with systems operating in the 2GHz frequency bands. Mobile WiMAX can complement established fixed infrastructure in high density areas whilst providing affordable new infrastructure for rural areas. Multiple vendor terminal availability will drive down costs, opening the opportunity for affordable high speed connectivity to the wider community.

c) In what way would you be interested in using and eventually commercialising BWA technologies?

As an advocate of WiMAX certified technology, Samsung Electronics is keen to accelerate the take up of BWA technology. We believe that WiMAX certification offers the first opportunity for BWA to reach a mass market and provide new innovative services previously not possible on a widespread basis.

5. Are there any other points you consider relevant?

No further comments.

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