

Friday, 28th September 2007

Consultation on the allocation of frequencies in the frequency bands 2010 – 2020 MHz and 2500 – 2690 MHz as well on the future use of the frequency bands 900/1800 MHz

Cover sheet for response to a Rundfunk und Telekom Regulierungs-GmbH consultation.

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Intel Corporation commends the Rundfunk und Telekom Regulierungs for the opportunity to provide our opinions on the future requirements and design of the 2.6 GHz spectrum award. It is vital that any regulatory framework enables the adoption and growth of new wireless technologies such as WiMAX, to the benefit of both Austrian and more generally global citizens. Intel Corporation prides itself in being recognised as the world's largest semiconductor manufacturer and a leader in technical innovation. Intel is also a leading manufacturer of communications and networking chips and equipment.

Intel agrees with a policy that assigns the spectrum in a technology neutral manner, and would also encourage spectrum trading to ensure "flexible and efficient use". This will enable the benefits of the rapid technological innovations that are occurring in the communications industry, and will promote the economic and social benefits that wireless broadband can deliver. In bands most promising for global harmonization, Intel recommends regulators should allocate abundant spectrum for Broadband Wireless Access (BWA) and allot licenses that have large bandwidth that are truly, flexible. Then licensees, in response to market forces, will be free to achieve the benefits of innovation and economies of scale and interoperability through the adoption of international standards. They will have an incentive to converge on one technology where the benefits of convergence are greater or adopt a new technology where those benefits are greater.

A handwritten signature in black ink, appearing to be "Peter Gibson", written over a horizontal line.

Consultation

**on the allocation of frequencies in the
frequency bands 2010 – 2020 MHz
and 2500 – 2690 MHz**

**as well on the future use of the
frequency bands 900/1800 MHz**

Vienna, August 2007

Rundfunk und Telekom
Regulierungs-GmbH

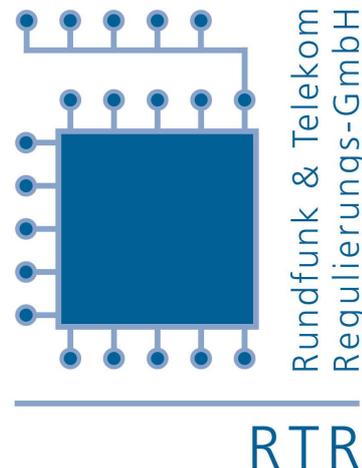


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1 Introduction

Rundfunk und Telekom Regulierungs-GmbH is holding a consultation on the following subject areas:

- Allocation of frequencies in the frequency bands 2010 – 2020 MHz and 2500 – 2690 MHz.
- Future use of the frequency bands 900/1800 MHz.

The consultation procedure is intended to be an initial approach to the subject areas mentioned. The specified contents are non-binding and do not prejudice the decisions of the Telekom-Control Commission.

To guarantee efficient and market conforming use of the frequencies to the greatest possible extent RTR-GmbH addresses the public with this consultation, putting individual items up for discussion.

2 Allocation of frequencies in the frequency bands 2010 – 2020 MHz and 2500 – 2690 MHz

2.1 General

a) As to 2010 – 2020 MHz

The frequency band 2010 – 2020 MHz originally intended for so-called self-provided applications due to international requirements is now available for terrestrial digital mobile communications systems in general, according to the Decision of the Electronic Communications Committee (ECC) of the European Conference of Postal and Communications Administrations (CEPT) of 24 March 2006 (ECC/DEC/(06)01).

b) As to 2500 – 2690 MHz

The frequency band 2500 – 2690 MHz was identified in the course of the World Radio Conference 2000 (WRC 2000) for IMT-2000 systems. Mandated by the European Commission CEPT developed plans for spectrum arrangements. These are reflected in the CEPT Decision EEC/DEC/(05)05, which provides that 2 x 70 MHz can be made available for FDD and 50 MHz for TDD or FDD operation (together with frequencies from other bands). In view of the efforts regarding technology and service neutral frequency allocations, it cannot be ruled out, however, that the frequency band 2500 – 2690 MHz will be also used for applications other than the ones specified in ECC/DEC/(05)05.

In Austria the frequencies at issue are now already available for allocation. These frequency bands are designated for use by terrestrial digital mobile communications systems.

2.2 Market overview

In 2000 six licences for the provision of mobile communications services using UMTS/IMT-2000 technology were allocated in Austria; each operator was assigned approx. 2 x 10 MHz from the frequency bands 1920 – 1980 MHz / 2110 – 2170 MHz (paired) or up to approx. 10 MHz from the bands 1900 – 1920 MHz and 2020 – 2025 MHz (unpaired), respectively.

At present, the situation is as follows: four operators are active in the frequency bands mentioned, each operator (Mobilkom Austria AG, T-Mobile Austria GmbH, One GmbH, Hutchison 3G Austria GmbH) having frequencies totalling approx. 2 x 15 MHz. Mobilkom Austria AG and T-Mobile Austria GmbH have additional 2 x 10 MHz from the unpaired frequency band, Hutchison 3G Austria GmbH has 5 MHz.

2.3 Responsibilities in the field of frequency administration

The provisions governing responsibility in the field of frequency administration are laid down in Art. 54 Par. 3 TKG 2003. Accordingly, the regulatory authority (Telekom-Control Commission) shall be responsible for allocation of the frequencies that have been specifically designated in the frequency usage plan pursuant to Art. 52 Par. 3 TKG (restriction in number). Responsibility for allocation of the remaining frequencies lies with the telecommunications authority.

As regards the frequencies in question, the Federal Minister of Transport, Innovation and Technology designated the frequencies in so far as the maximum number of allocated frequencies will be restricted.

This means that the Telekom-Control Commission is responsible for allocation of the frequencies at issue.

In the run-up to such planned allocation by the Telekom-Control Commission, Rundfunk und Telekom Regulierungs-GmbH is now holding a consultation.

2.4 Consultation

2.4.1 Terms and conditions of use

- **The CEPT/ECC Decision ECC/DEC/(05)05 provides for the following channelling arrangements in the frequency band 2500 – 2690 MHz for FDD and TDD:**

2500 MHz	2505 MHz	2510 MHz	2515 MHz	2520 MHz	2525 MHz	2530 MHz	2535 MHz	2540 MHz	2545 MHz	2550 MHz	2555 MHz	2560 MHz	2565 MHz	2570 MHz	2575 MHz	2580 MHz	2585 MHz	2590 MHz	2595 MHz	2600 MHz	2605 MHz	2610 MHz	2615 MHz	2620 MHz	2625 MHz	2630 MHz	2635 MHz	2640 MHz	2645 MHz	2650 MHz	2655 MHz	2660 MHz	2665 MHz	2670 MHz	2675 MHz	2680 MHz	2685 MHz	2690 MHz
UL 01	UL 02	UL 03	UL 04	UL 05	UL 06	UL 07	UL 08	UL 09	UL 10	UL 11	UL 12	UL 13	UL 14	TDD / FDD Downlink (External)										DL 01	DL 02	DL 03	DL 04	DL 05	DL 06	DL 07	DL 08	DL 09	DL 10	DL 11	DL 12	DL 13	DL 14	
FDD Uplink Blocks																								FDD Downlink Blocks														

Do you consider these channelling arrangements useful?

Yes

Reasons:

No

Reasons, alternative proposals:

The ECC Decision (05)05 predates the introduction of other broadband technologies that can offer value added mobile broadband services not previously considered. The band plan was developed predominately by those focused on FDD options offering IMT-2000 services and therefore it can be argued that the band plan has not been subjected to any up to date market study.

Intel supports the approach that Ofcom (UK) is currently proposing, we therefore propose that for the 2.6 GHz band the decision of how the band is designed relative to paired versus continuous bands can be determined through a 2 tiered auction process. This will then optimize the banding based on the market demand. We also note that any paired bands determined through the process be separated by a 120 MHz duplex gap to minimize product variants. In addition we believe that irrespective of the final banding, TDD should also be allowed to be used in any of the paired bands.

The current ECC Decision band plan offers no flexibility where there is more than one operator interested in a TDD licence. The current 50 MHz TDD allocation would support only one licensee. This is further endorsed by the fact that the current ECC Decision suggests that any guard band requirements are borne by the TDD allocation. This has the risk of burdening the TDD licensee irrespective of the deployment methods used by a neighbouring FDD licensee.

- **Is it useful to allocate the frequency band 2010-2020 MHz at the same time? If so, what should the terms and conditions of use be?**

Yes

Reasons:

Intel has no specific comment to make on this proposal.

No

Reasons:

Intel has no specific comment to make on this proposal.

- **Do you consider it useful to use the band 2570 – 2690 MHz also as FDD downlink together with the frequency band 2010-2020 MHz not yet assigned?**

Yes

Reasons:

No

Reasons:

The FDD downlink option would directly impact on the spectrum allocated for TDD technologies. In addition the current ECC PT1 working assumption is that any FDD downlink option would prohibit the use of TDD in the band. Intel does not consider allocating just 10 MHz of 50 MHz of available spectrum for an FDD downlink option and therefore sterilising 40 MHz of valuable spectrum as being efficient use of the available spectrum. The ECC Decision (05)05 has been in existence for almost 3 years and there has been no specific demand for additional FDD spectrum for IMT-2000. It is not clear why yet more FDD spectrum is therefore a necessity? Indications elsewhere globally show strong demand for TDD spectrum in this band. The multi billion dollar investment made by Sprint/Nextel and Clearwire is an example of such demand.

Additionally, the external paring would increase terminal complexity (for example additional duplex filtering) and resulting in higher terminal costs without offering a sufficient increase of throughput capacity.

- **It cannot be ruled out the frequency bands 2500-2690 MHz and 2010-2020 MHz will be assigned according to the principle of technology and service neutrality, provided that in-band and out-of-band compatibility can be guaranteed. Which aspects do you think should be considered here?**

Intel is fully supportive in the principle of technology and service neutrality. The work ongoing in CEPT under WAPECS will ensure that the minimum technical requirements are developed and Intel notes that the 2500 – 2690 MHz band is considered as one of the priority bands under review. The in-band compatibility requirements are an issue primarily between the licensees as well as the licence conditions which should not be overly restrictive and provide flexibility to enable mutually acceptable interference conditions.

- **Against the background of technology neutrality, do you think it will be sufficient to define a field strength value or spectrum masks, or is advance coordination with preferred frequencies/preferred codes absolutely required?**

Yes

Reasons:

No

Reasons:

Intel would encourage the regulatory authority to consider the work ongoing in SE42 which is specifically addressing the issue of technology neutrality in the context of WAPECS. A Block Edge Mask together with other issues supporting technology neutral licencing are under development.

- **What term of use do you consider practicable for the frequencies in question?**

According to the steadily increasing importance of IP based data transfer over the radio interface, the usage of the frequencies in question and especially the 2.6 GHz band should be based on assignment of unpaired spectrum with preferably synchronised TDD operation.

Please consider that the symmetry/asymmetry factor determined by paired spectrum is fixed for the life of the licence. The symmetry/asymmetry factor determined by synchronised TDD can be changed according to agreements between operators at any time.

2.4.2 Division of the frequency band

- **Do you consider it useful to divide the spectrum into individual abstract 5 MHz blocks (or pairs of 2x5 MHz with FDD) or shall the regulatory authority identify specific – larger – packages?**

Yes

Reasons:

Enabling licensee choice on how much spectrum to bid for is more appropriate than the regulatory authority trying to “guess” what should be considered as the optimum spectrum package. Intel would also suggest that the number of TDD blocks required should also be part of this approach. Seeking the demand prior to bidding in the auction should be considered and is the approach proposed by some other Administrations. Does the regulatory authority believe that the demand for TDD spectrum is limited to one licence?

- No (What kind of spectrum division do you consider useful and why?)

Reasons:

- **It is planned to restrict the maximum number of frequency packages a bidder may acquire. Which spectrum restrictions (in MHz or 5 MHz packages) do you consider appropriate?**

Intel has no firm opinion on maximum spectrum that a licensee can acquire. Intel would always encourage the efficient use of spectrum and would discourage spectrum hoarding.

- **It is planned to assign the packages on a nationwide basis (i.e. not regionally). Which aspects shall be considered here?**

Intel supports national wide assignment of spectrum packages because it supports greater economics of scale and a competitive market environment for the overall benefit of the Austrian citizen.

- **How do you rate the demand for and the availability of equipment in these frequency bands? Which technologies and services do you want to use or provide?**

Intel considers that the 2.6 GHz band will support a number of technologies delivering any number of varying mobile broadband services. It is important that any regulatory framework embraces the principle of technology neutrality. Intel is a founding member and Board member of the WiMAX Forum and has invested in the development of WiMAX. Access to spectrum for WiMAX is fundamental and enables ultimately consumer choice. Intel requests that spectrum is made available expediently and with no restriction to the technology used to support the services for the benefit of the consumer.

2.4.3 Time schedule

- **The regulatory authority plans to start the allocation procedure in mid-2008. Do you think this time schedule is suitable to take account of the future spectrum requirements and the technological development?**

Yes

Reasons:

Intel supports the availability of this spectrum (2.6 GHz band) as soon as possible. Other regulatory authorities are moving forward with their plans to release the 2.6 GHz band in a similar timeframe.

No

Reasons:

2.4.4 Secondary provisions of frequency allocation

- **Do you consider a newcomer's (attempt at) market entry in connection with allocation of the frequencies at issue realistic?**

Yes

Reasons:

Newcomers equipped with a sufficient amount of spectrum would be able to compete with incumbents. Using advanced BWA technologies (like WiMAX) they are able to offer a variety of value added and varied services. Mobile broadband internet access at an affordable price is a compelling argument for market entry.

No

Reasons:

- **Which measures shall be taken to facilitate market entry by newcomers (see e.g. national roaming obligation as on the occasion of IMT frequency allocation in 2000)?**

Not only measures to the newcomers should apply but also mechanisms protecting them from unfair actions of incumbents (e.g. artificially high backhaul pricing over the existing networks) should be considered.

- **Against the background of technology and service neutrality, what should the coverage obligations be like?**

Intel has nothing specific to offer.

3 Future use of the frequency bands 900/1800 MHz

3.1 General

The European Commission is currently preparing a decision regarding harmonisation of the frequency bands 900 MHz and 1800 MHz (Decision on the harmonisation of the 900 MHz and 1800 MHz frequency bands for terrestrial systems capable of providing pan-European electronic communications services in the Community). The objective of this decision is to open the frequency bands 900 MHz and 1800 MHz, which are currently reserved for GSM technologies, for use by other mobile communications technologies. The annex to the planned decision makes explicit reference to UMTS. However, Art. 3 No. 3 of the planned decision goes even further and aims at facilitating also technologies not listed in the annex, provided that they can co-exist in the same frequency band with the systems listed.

3.2 Market overview

In Austria the frequency bands 900 MHz and 1800 MHz have been assigned for the provision of mobile communications services by means of GSM technology. The frequencies are held by Mobilkom Austria AG (approx. 32 MHz), T-Mobile Austria GmbH (approx. 38 MHz) and One GmbH (approx. 32 MHz). The frequency allocations are limited in time until the end of 2015, 2017 and 2019, respectively.

3.3 Consultation

The activities at the European level also raise questions at the national level regarding the further course of action in respect of the use of the frequency bands at issue.

- **How do you expect GSM to further develop? In your estimate, what will the lifetime of GSM be?**

No comment from Intel

- **In which of the frequency bands listed here will it be useful to use new technologies (“refarming”)?**

Dependant on market needs and operators' plans to satisfy those market requirements.

- **How do you rate the availability of equipment for IMT in the frequency bands 900/1800 MHz?**

Dependant on market needs and operators' plans to satisfy those market requirements.

- **Where do you see critical aspects of a possible refarming solution? What kind of solution could satisfy all market participants?**

The GSM as a robust voice telephony system will remain popular in the 900/1800 MHz GSM bands. UMTS has yet to prove itself as a successful service in serving data due in part to the lack of market acceptance for limited throughput capacity and which has resulted in high pricing of these services. Intel expects that OFDM based BWA systems (e.g. WiMAX) will achieve higher popularity and greater acceptance as an IP based open architecture.

4 Participant

Name/company (address):

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Are you interested in 2500 – 2690 MHz spectrum use?

Yes

No

Are you interested in 2010 – 2020 MHz spectrum use?

Yes

No

Are you interested in 900 MHz and 1800 MHz spectrum refarming?

Yes

No

5 Invitation for comments

Comments shall be sent no later than 28 September 2007 per e-mail to

Konsultationen@rtr.at

in a common format suitable for electronic processing (e.g. text, pdf). Unless requested otherwise, the comments will be published on the website of RTR GmbH.

I/We agree that the comment will be published in full.

- Yes, by stating the name of the company
- Yes, without stating the name of the company
- No