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Responsabile del procedimento

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Rome, 25th November 2008

Dear Mr Martino

Qualcomm response to the "Consultazione pubblica sull'utilizzo della banda di frequenze a 2.6 GHz".

Qualcomm welcomes the opportunity to respond to the public consultation regarding the use of the band 2500-2690 MHz.

Qualcomm believes that in order to enable innovation, competition and the successful commercial development of wireless technologies in Italy and in Europe, the spectrum policy framework should be based on technology neutrality through standards competition, application neutrality and pan-European implementation of harmonized technical spectrum usage rights and band plans.

Harmonization of technical spectrum usage rights and band plans is critical to:

- guarantee the access to equipment benefiting from economies of scale,
- reduce the risk of interference and maximize the use of valuable spectrum.

The decision from the European Commission of 13 June 2008 "*on the harmonisation of the 2500-2690 MHz frequency band for terrestrial systems capable of providing electronic communications services in the Community*" (2008/477/EC) is based on the harmonized band plan defined by the ECC Decision ECC/DEC/(05)/05. The possibility to deviate nationally from the harmonized band plan as defined in ECC Decision(05)05 should be analyzed in the context of both the CEPT Report 19 and the ECC Report 131 (currently under public consultation), which implies that specific terminals are required for non-harmonized band plans. Mass market cannot be based on country specific terminals as economies of scale are critical to the timely availability of affordable terminals.

Mobile Broadband has been recognized as crucial for a sustainable economic growth. Therefore, Qualcomm believes that citizens' best interest lies in ensuring the rapid deployment and coverage extension of networks. The 2500-2690MHz is a unique opportunity to guarantee the availability of high quality mobile broadband due to the large channels bandwidth, and is too valuable to restrict it to niche market. Therefore, Qualcomm strongly recommends to adopt the ECC/DEC/(05)05 harmonized band plan.

Qualcomm's detailed responses to the proposals put forward in the public consultation are further detailed in the Annex. Wassim Chourbaji (*email*: wassim@qualcomm.com, *phone*: +390649218100) remains available for any further information you may request regarding this response.

Sincerely yours,

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ANNEX

Qualcomm response to the public consultation regarding the use of the band 2500-2690 MHz

1. Standard, tecnologie e mercati

1.1) Quali sono gli standard e le tecnologie che il rispondente prevede possano essere introdotti per l'utilizzo nella banda 2.6 GHz ? Che tipo di architetture di rete si prevedono ? Che modalità di gestione dello spettro adopereranno ?

Qualcomm supports technology and application neutrality as Qualcomm believes that technology and application neutrality provides the right framework to enable innovation, competition and the successful commercial development of wireless technologies. As such, Qualcomm is looking forward to innovation to provide the best services to all customers.

Mobile broadband has been recognized as a key driver of national economic competitiveness. Mobile broadband is crucial for economic growth and efficiency gains. Qualcomm considers that the 2.6 GHz will sustain the fast market growth of 3G services and future 4G services. With more than 705 million subscribers worldwide, 3G technologies are continuing to evolve towards higher data rate capabilities (such as HSPA+ and Long Term Evolution - LTE) that will benefit from the 2.6 GHz which offers the unique opportunity of wider bandwidths up to 20 MHz and additional capacity.

Technology neutrality and European harmonized equipment can be both enabled through adopting the ECC/DEC/(05)05 band plan and following the WAPECS requirements as defined by the CEPT in the Report 19 and subsequent report on terminal to terminal interference, as well as related 3GPP standards and spurious emission requirements.

1.2) Quando saranno disponibili i terminali e gli apparati di rete ? Che costi sono ipotizzabili ?

Qualcomm plans to integrate support for the 2.6GHz band into its UMTS and LTE chipset portfolio. Qualcomm's OEM customers are expected to launch end-user devices based on these solutions in 2009. Operator trials of 2.6GHz OEM devices may start earlier in 2009.

Qualcomm is also committed to the success of the Long Term Evolution (LTE) standard. Qualcomm has already announced the Industry's first Standsrds-compliant LTE/3G Multi-mode solution. LTE testing agreements are in place with a major vendor and Qualcomm is looking forward to enabling LTE access to the market. LTE trials are expected late 2009 with commercialization in 2010.

1.3) Quali servizi potrebbero essere offerti nella banda di frequenze in argomento ?

Qualcomm believes that in order to enable innovation, competition and the successful commercial development of wireless technologies in Italy and in Europe, the spectrum policy framework should be based on technology neutrality through standards competition, *application neutrality* and pan-European implementation of harmonized technical spectrum usage rights and band plans. While Qualcomm supports the principle of *application neutrality*, we consider that *'radio' service neutrality* would lead to an increased risk of interference and inefficient use of spectrum and should therefore be avoided.

2. Gestione dei rischi di interferenze e canalizzazione della banda

2.1) Il rispondente indichi se condivide l'approccio suggerito di utilizzare la canalizzazione e le regole di coesistenza previste dalla CEPT e dalla Decisione Della Commissione, ivi inclusa l'imposizione dell'utilizzo del blocco ristretto TDD nella parte bassa di ciascuna assegnazione contigua TDD. In particolare ritiene che occorra lasciare variabile, in base alla domanda, il numero complessivo di blocchi TDD (opzione A), oppure ritiene che occorra attenersi strettamente alla canalizzazione CEPT (opzione B) ?. In caso non ritenga appropriate entrambe le opzioni il rispondente fornisca le ragioni per procedere differentemente.

Qualcomm supports the option B and urges Italy to adopt the harmonized band plan defined by the ECC/DEC/(05)05 band plan.

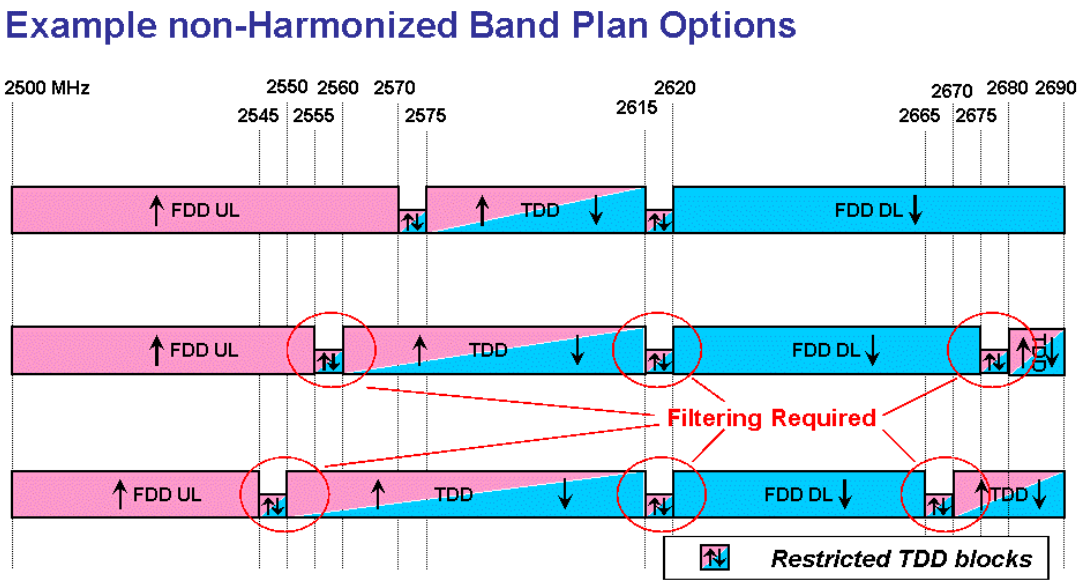
Qualcomm would like to stress that the CEPT Report 19 does not provide the full picture of the CEPT studies on WAPECS in the 2500-2690MHz as clearly expressed by the ECC when Report 19 was adopted. Indeed, the ECC required SE42 to develop further studies related to terminal to terminal interference in the 2.6 GHz band which led to the development of Report 131. Qualcomm was heavily involved in these studies and would like to stress that the CEPT and ETSI developed a set of general regulatory rules including:

- The harmonized band plan as defined by the ECC/DEC/(05)05,
- Base station Block Edge Masks (BEMs) as defined in CEPT Report 19,
- Terminal BEMs as defined by ECC Report 131 (finalized and adopted by SE42 and currently under public consultation before final adoption by the ECC),
- Harmonized European standards developed by the ETSI for the 2500-2690MHz band,
- Spurious emission levels defined by SDOs such as the ETSI, which apply independently of BEM requirements. Qualcomm would like to remind the AGCOM that successful interference management requires the application of all the elements of this set of regulatory rules, not only the CEPT Report 19.

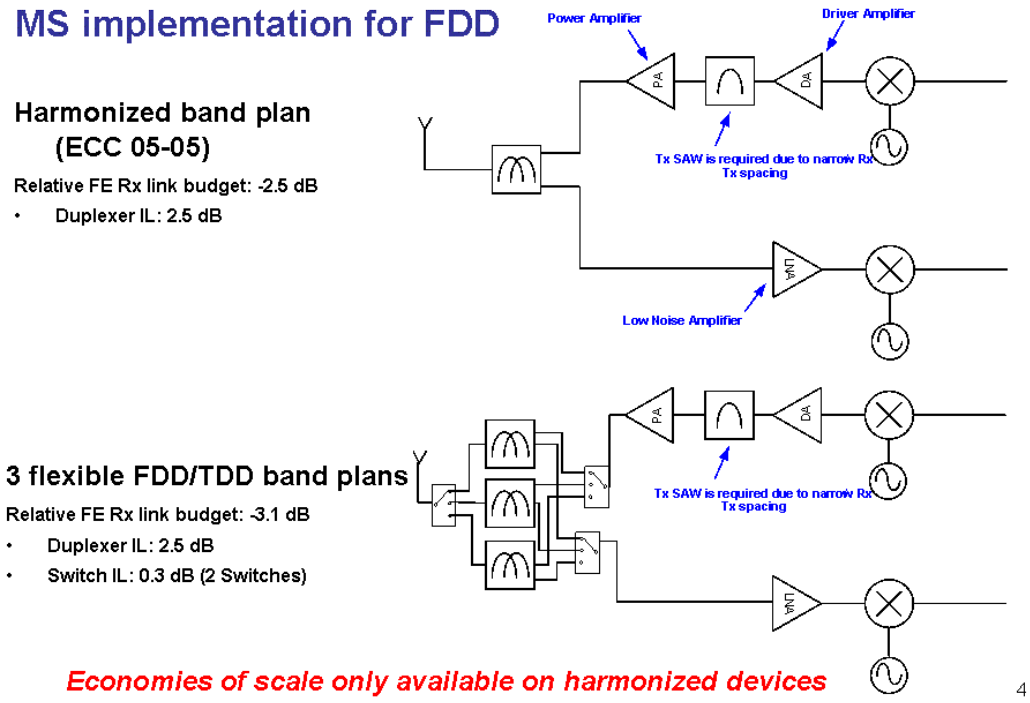
Indeed, the public consultation of the CEPT Report 19 highlighted the absence of studies of terminal to terminal interference in this report. Following this public consultation, the ECC Report 131 (currently under public consultation) was developed to provide guidance to National Regulation Agencies and the ETSI on WAPECS conditions of access to the 2.6 GHz band for terminals, in the form of BEMs. ECC Report 131 highlights the following principles:

- Terminal BEMs are more stringent than most technologies spectrum emission mask,
- Spurious emission levels as defined by SDOs in HENs apply irrespectively of terminal BEMs.

Therefore, from a design and implementation perspective, filtering will be required in terminals at FDD/TDD boundaries as well as at the edge of non-synchronized TDD spectrum bands. This is illustrated in the Figure below.



From the conclusion of ECC Report 131, it is clear that country-specific terminals would be required to operate in a non-harmonized band plan as illustrated in the figure below.



Terminals designed to operate in a non-harmonized band plan would be excessively more expensive, as they would not benefit from economies of scale. These terminals would also

perform worse in sensitivity and have a shorter talk time (require more power). Even worse: it is yet unclear that TDD terminals would be able to operate in the top part of the band (e.g. 2680-2690 in the Figure 1 above) as they would have to respect very stringent filtering requirements which may exceed the performance level of current filter technology.

Finally, the ECC in its June 2008 meeting reiterated its integral support for the harmonized band plan defined by the ECC/DEC/(05)05. The ECC reviewed the band plan and decided against introducing FDD/TDD flexibility in the band plan. As such, the ETSI will base all future harmonized standards on the harmonized band plan. Selecting a non-harmonized standard would force country to introduce non standardized terminals.

Qualcomm urges Italy to adopt the 2.6 GHz European harmonized band plan as set in ECC DEC/(05)05 and which comprises 2x70 MHz FDD and 50 MHz TDD or external FDD. Indeed, irrespective of the standards or services that may be deployed, a common and harmonized band plan reduces the risks of interference and facilitates economies of scale, which in turn brings benefits to consumers and citizens. Other countries in Europe such as Germany and Sweden acknowledged those benefits and decided to adopt the ECC(05)05 harmonized band plan for the 2.6 GHz band. A flexible FDD/TDD scheme will not provide benefits to either paired or unpaired operations; it will be detrimental to the ongoing success of mobile broadband services in Europe and will lead to specific countries handsets or will increase the risk of interference.

2.2) Sono sufficienti, a parere del rispondente, le norme contenute nella Decisione della Commissione riprese dal Report 19 CEPT, per prevenire le interferenze nocive nei vari casi possibili ? Che tipo di ulteriore coordinamento dovrebbe essere necessario fra operatori (sia a livello intra-service che inter-service), sia tra bande adiacenti che fra aree adiacenti ? Che tipo di ulteriore coordinamento dovrebbe essere necessario a livello internazionale ? Esistono altri studi in corso di definizione a riguardo ?

Qualcomm would like to stress that the EC Decision 2008/477/EC and the CEPT Report 19 are not sufficient to avoid harmful interference. This was fully recognized by the CEPT and resulted in the development of the ECC Report 131 (currently under public consultation).

Qualcomm reminds the AGCOM that successful interference management requires the application of all the elements of the following set of regulatory rules:

- The harmonized band plan as defined by the ECC/DEC/(05)05,
- Base station Block Edge Masks (BEMs) as defined in CEPT Report 19,

- Terminal BEMs as defined by ECC Report 131 (currently under public consultation),
- Harmonized European standards developed by the ETSI for the 2500-2690MHz band,
- Spurious emission levels defined by SDOs such as the ETSI, which apply independently of BEM requirements, not only the CEPT Report 19.

Some countries in Europe such as Germany and Sweden already adopted the ECC(05)05 harmonized band plan for the 2.6 GHz band. As most European countries are expected to adopt the harmonized band plan, cross-border interference will be very easy to manage if the harmonized band plan is selected in Italy. Otherwise, severe cross border interference will occur between co-channel TDD and FDD networks from one side to the other of the border.

Likewise, inter-service interference and FDD intra-service interference will be easily managed in the harmonized band plan by respecting the ETSI HEN Spectrum Emission Masks. TDD intra-service interference may require additional measures which are not defined yet.

Taking into account the conclusions of ECC Report 131 regarding the BEM in TDD restricted blocks and taking into account the large size of the 2.6 GHz band, transforming the restricted blocks into guard bands between FDD/TDD or between unsynchronized TDD operators would be one solution to minimize the risk of interference.

Qualcomm urges Italy to adopt the 2.6 GHz European harmonized band plan as set in ECC DEC/(05)05 and which comprises 2x70 MHz FDD and 50 MHz TDD or external FDD. Indeed, irrespective of the standards or services that may be deployed, a common and harmonized band plan reduces the risks of interference and facilitates economies of scale, which in turn brings benefits to consumers and citizens.

3. Modalità di rilascio dei diritti d'uso

3.1) Si è d'accordo nel prevedere, per le procedure di assegnazione, un minimo ed un massimo per ciascun soggetto di banda assegnabile in multipli di 5 MHz, con un minimo di 10 ed un massimo di 50 MHz ?

All current and future technology expected in this band (e.g. HSPA, LTE) are designed for channel bandwidth multiples of 5MHz. Moreover, studies from the CEPT to define the WAPECS conditions of access to the band (CEPT Report 19 and ECC Report 131) were based on hypothetical systems operating on channel bandwidth multiples of 5MHz.

Therefore, Qualcomm supports spectrum allocation based on 5MHz channels.

3.2) Fatto salvo il cap di cui sopra, quanti blocchi (numero dei diritti d'uso) dovrebbero essere idealmente aggiudicati per area di servizio al fine di offrire servizi commercialmente remunerativi ed allo stesso tempo prevedere una effettiva concorrenza, sia nel caso TDD che FDD ?

Qualcomm supports a spectrum allocation based on 5 MHz channels. Mobile operators should be able aquire up 2 x 20 MHz of FDD spectrum in order to take full benefits of advance future evolutions in the mobile technologies (e.g. LTE).

3.3) Si è d'accordo con la procedura selettiva generale proposta dall'Autorità (asta a due fasi, con clock auction nella prima fase per lotti generici seguita da graduatoria mediante offerta libera in busta chiusa per l'attribuzione nella seconda fase) ? Il rispondente può proporre delle alternative, specificando esattamente quali sarebbero i vantaggi dell'alternativa ?

Mobile Broadband is crucial for a sustainable economic growth. Therefore, Qualcomm believes that citizens' best interest lies in ensuring the rapid deployment and coverage extension of networks. Qualcomm fears that a purely auction-based award process will preempt valuable investment that will no longer be available for subsequent network deployment.

3.4) Si è d'accordo con una pianificazione dei diritti d'uso su base geografica nazionale ?

Qualcomm believes that the 2.6 GHz licenses should be granted on a national basis to ensure the following benefits:

- National networks allow timely deployment of the technology throughout the country which will benefit citizens,
- National networks are likely to cost less than a collection of regional networks due to the economies of scale achievable by the network operators,
- National networks ensure uniformity of the price on a national level and national access for the consumers
- National licenses will reduce the loss of efficiency and coverage as well as interference usually experienced at the edge of the licensing areas.

3.5) Si è d'accordo con i criteri di fissazione del valore minimo di partenza dell'asta per blocco accoppiato da 5 MHz proposto ?

See Question 3.3.

4. Condizioni associate al rilascio dei diritti d'uso delle frequenze e tempistica

4.2) Si concorda con la proposta dell'Autorità in merito agli obblighi di copertura ?

Mobile Broadband is crucial for a sustainable economic growth. Therefore, Qualcomm believes that citizens' best interest lies in ensuring the rapid deployment and coverage extension of networks. Qualcomm would generally recommend to shift the focus from the purely auction-based approach to an approach based on more ambitious obligations of coverage, noting that the 2.6 GHz is more adapted to considerably increase the capacities of mobile networks mainly in urban areas and hot spots.

4.3) Si è d'accordo con la durata proposta per i diritti d'uso delle frequenze in questione?

Qualcomm believes that in order to maintain fair competition conditions between mobile operators, the right of use duration would need to be aligned with those of the 2 GHz band.

4.5) Il rispondente ritiene che occorra introdurre delle specifiche riserve di banda a favore di alcune categorie di soggetti, ad esempio nuovi entranti ? In caso affermativo, come potrebbe essere definito, a parere del rispondente, un operatore nuovo entrante nel contesto del rilascio dei diritti d'uso delle frequenze in questione ? Quali potrebbero essere le riserve a favore del nuovo entrante ? Nel caso si óptese prevedere la riserva di una specifica porzione di banda, come dovrebbe essere individuata tale porzione ed attuata una procedura ristretta, nel caso delle opzioni A e B ?

Qualcomm believes that there should be no restrictions and existing mobile operators should be able to participate in the 2.6 GHz spectrum allocation process. HSPA+/LTE networks that can be rolled out in the 2.6 GHz band are fully complementary to the other GSM and HSPA networks in other frequency bands. The 2500-2690MHz band is indeed suited to offer a very

high network capacity in hotspots and areas with large traffic. These networks are supposed to be overlay networks of other existing networks, at least as a first step.
