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**For more information, contact:**  
Chair, Regulatory Working Group  
[rwg-chair@wimaxforum.org](mailto:rwg-chair@wimaxforum.org)

Chairman  
Telecom Regulatory Authority of India  
Mahanagar Doorsanchar Bhawan,  
Jawahar Lal Nehru Marg, New Delhi-110 002.

E-mail : [sudhircgupta@tra.gov.in](mailto:sudhircgupta@tra.gov.in)

### **TRAI Consultation on BWA Spectrum**

The WiMAX Forum<sup>®,1</sup> welcomes the opportunity to provide its views and comments concerning the issues raised in the TRAI consultation of May 2008.

The WiMAX Forum is an industry-led, non-profit corporation formed to promote and certify the compatibility and interoperability of broadband wireless products using the IEEE 802.16 and ETSI HiperMAN wireless MAN specifications. The WiMAX Forum's goal is to accelerate the introduction of these devices into the marketplace. WiMAX Forum Certified<sup>™</sup> products will be fully interoperable and support Fixed, Nomadic and Mobile Broadband Applications. For more information about the WiMAX Forum and its activities, please visit [www.WiMAXForum.org](http://www.WiMAXForum.org).

To provide the certainty to allow large scale network deployments and volume production of commercial products, the WiMAX Forum has developed WiMAX Certification Profiles and a certification process for these Profiles. This provides the basis for the supply of interoperable network and consumer products to the global market. The Profiles will be developed further as the future WiMAX standards develop. WiMAX is currently being deployed in both the 2.x and 3.x GHz bands. The dominant bands will be determined by spectrum availability for mobile broadband technologies across the globe and the cumulative level of investment in each band. However, the 2300-2400, 2500-2690 and 3400-3600 MHz bands are major bands for WiMAX rollout in most parts of the globe.

Ubiquitous broadband services enhance the growth of GDP and offer enhancements in quality of life through societal applications including e-education, e-medicine, e-governance, entertainment as well as employment. WiMAX technology, through its ability to provide a wide variety of data rates over large distances is uniquely suitable to provide the above broadband services. With the flexibility that WiMAX access affords, a service provider can offer high-speed connectivity or mobile broadband services with millions of users not only in metropolitan areas but also in rural and remote areas. We believe that WiMAX is best-suited to deliver the services and capabilities required in India.

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<sup>1</sup> "WiMAX Forum<sup>®</sup>" and "WiMAX Forum CERTIFIED<sup>™</sup>" are trademarks of the WiMAX Forum.

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The release of spectrum for broadband wireless access should occur without further delay due to the extensive economic and social benefits that the widespread availability of broadband services would bring to India's citizens. The WiMAX Forum believes that WiMAX is the best technology to assist India to achieve its broadband goals. However, the WiMAX Forum recommends that spectrum be released in a technology neutral manner and not be tied to particular technologies.

**The WiMAX Forum respectfully submits the comments in Annex 1 with regard to this consultation.**

Yours sincerely

Tim Hewitt  
WiMAX Forum  
Chair - Regulatory Working Group

## **ANNEX 1 WiMAX Forum response to questions in Consultation Document**

### **Responses to Questions**

***1. What should be the revised reserve price for the spectrum in 3.3.-3.6 GHz band? The various options available are as below:***

- The reserve price of this spectrum remains as recommended earlier.***
- The reserve price for the spectrum is made equal to 50% of the reserve price recommended for the 3G spectrum.***
- The reserve price is made equal to the price recommended for the 3G spectrum***

The WiMAX Forum prefers the first option of the reserve price remaining as recommended earlier.

The setting of the precise reserve price involves many Indian specific factors about which the WiMAX Forum is not expert to comment. It does, however, note that the options linking the reserve price for the 3.3 to 3.6 GHz band and the 3G spectrum (2.1 GHz) auction would appear to assume that the business models for the 2.1 GHz spectrum and the 3.3 to 3.6 GHz band are the same. This will likely not be the case as distinctly difference services and hence business models currently anticipated. Furthermore, there is a marked difference in RF propagation factors in the 2.1 GHz and 3.3 GHz spectrum. Therefore, licensees of 3.3-3.6 GHz spectrum will need to deploy additional base stations and face higher CAPEX costs to provide comparable coverage to services in the 2.1 GHz band.

The WiMAX Forum is also concerned that linking the 3.3 to 3.6 GHz reserve price to prices achieved in the 3G auction implies that the auction of this spectrum will be forced to be delayed until after the 3G auction. There does not appear to be a reason for this and it may lead to unnecessary delays in the allocation of spectrum that can be used to provide broadband services and the associated benefits of broadband to the citizens and economy of India.

It is also relevant that *DOT Guidelines for 3G & BWA* issued on 12<sup>th</sup> November 2007 clearly indicate that BWA services will be permitted in 2.5GHz band and other service providers (not those issued 2.5 GHz spectrum) will be considered for spectrum allotment in 2.3 GHz and 3.3 - 3.4 GHz band

***2. What should be the eligibility conditions for bidding for spectrum in the bands of 2.3-2.4 GHz and 2.5-2.69 GHz?***

The WiMAX Forum has no comment to make on this issue.

***3. In the 2.3-2.4 GHz band, the maximum amount of spectrum which a licensee can bid for?***

The WiMAX Forum does not have a view on any award “Spectrum Cap” but has consistently recommended that, for high density consumer situations, a minimum of 30 MHz per operators is required (see the Forum’s White paper “A Review of Spectrum Requirements for Mobile WiMAX™ Equipment to Support Wireless Personal Broadband Services”). A smaller amount of spectrum (e.g. 15 MHz), could be adequate for low traffic density areas. In the medium term, allocation of less spectrum to each operator will lead to a requirement for more base stations than would otherwise be necessary and hence increased service costs for consumers, lower data rates than otherwise, reduced service viability and/or a reduced range of services.

***4. In the 2.3-2.4 GHz band, the size of the spectrum blocks for the bidding?***

Recent activities by regulatory authorities seem to be allocating the 2.3-2.4 GHz band in lots of 5 MHz blocks. This is consistent with technology trends. For example, WiMAX Forum Certification Profiles exist for 5 and 10 MHz channels in this band. Therefore, the minimum spectrum lot for bidding should be 5 MHz.

The WiMAX Forum recommends that bidders should be allowed to aggregate lots into larger blocks, especially for areas likely to be capacity constrained. The auction process should be designed to ensure that the operators are licensed for contiguous spectrum lots.

With reference to the consultation paper on MVNOs issued by TRAI on 5 May 2008, we note that such an approach to facilitating competition could have advantages over and above dividing the available spectrum in small, potentially inefficient chunks.

***5. In view of limited availability of spectrum in this band and possible conflict between the technologies using FDD and TDD modes, how the spectrum in 2.6 GHz band be allocated?***

The WiMAX Forum supports a technology neutral spectrum licensing approach and, in particular, one that allows operators to decide as part of the spectrum allocation process whether they want paired or unpaired spectrum. This would include permitting TDD within that part of the spectrum that might be paired in some countries or regions. It would be desirable to retain the 120 MHz duplexing gap for any paired spectrum.

The WiMAX Forum supports the award of the 2.5-2.69 GHz band at the earliest opportunity in order to enable presently unsatisfied market demand for high speed personal broadband services to be addressed and to give service providers the option to select Mobile WiMAX™ technology.

TDD and FDD can successfully co-exist in the same band under suitable technical arrangements as discussed in the WiMAX Forum Paper “Service Recommendations to Support Technology Neutral Allocations FDD/TDD Coexistence”. Interference

between TDD and FDD operators has also been extensively studied by Ofcom (UK) which is now proposing to proceed with a technology neutral spectrum auction with the FDD/TDD use determined as part of the auction as noted in the TRAI consultation paper.

Furthermore, in the decision of 2 April 2008 (RSCOM08-02) the European Commission provides for a more flexible use of the 2.5-2.69 GHz band and referred to CEPT report 19 (21 December 2007) which contains technical conditions and guidance for the application of least restrictive conditions to base stations and terminal stations operating in the 2500-2690 MHz band, which are appropriate to manage the risk of harmful interference. This includes requirements for compatibility between adjacent TDD and FDD blocks or unsynchronized TDD blocks.

In summary, the WMF recommends a technology neutral approach, inclusive TDD and FDD technologies, that allows operators to choose the technology best suited to their business models. This approach is consistent with the policies of many major regulatory authorities, including the EC.

***6. In case the present available spectrum is allocated for BWA technologies using unpaired spectrum, then, will it be feasible in future, from technical and economic angle, to refarm the allocated spectrum in the 2.6 GHz band in line with the global practices?***

The proposed use of the unpaired spectrum in this band for TDD BWA applications is already in line with global standards and practices. The Radio Regulations allocate this band to the Mobile Service. The ITU-R has also published recommended band plans (Recommendation ITU-R M.1036) for those countries who would like to identify the use of this band by various IMT technologies including OFDMA-TDD-WMAN (WiMAX). One of the band plan options recommended is flexible TDD/FDD. Hence there should be no need for any re-farming of the allocated spectrum. Also see the European Commission decision reference above.

***7. Unlike a number of other countries, a major portion of spectrum in the 2.6 GHz band is yet to be got vacated by WPC. What measures can be taken to accelerate the process of vacation so that the Indian telecom sector is not at a disadvantage in relation to other countries?***

Recognizing the potential of ubiquitous broadband service in growth of GDP and enhancement in quality of life through societal applications including e-education, e-medicine, e-governance, entertainment as well as employment generation by way of high speed access to information and web-based communication, the Government of India needs to accelerate the growth of broadband services. This can be done by quickly deploying flexible, wireless broadband access (BWA) technologies. With the flexibility that wireless broadband access affords, a service provider can offer high-speed connectivity or mobile broadband services with millions of users not only in metropolitan areas but also in rural and remote areas.

In this scenario, the use of 2.5 GHz spectrum is critical for BWA and the Government should take urgent steps to clear this band and not allow any new satellite services in this band.

***8. What should be their reserve price for the purpose of auction for the spectrum in 2.3-2.4 GHz and 2.5-2.69 GHz?***

The WiMAX Forum recommends that the reserve price be determined by either an economic study to determine the value of the spectrum or using the reserve price as previously recommended by TRAI for the 3.3 to 3.6 GHz band. Ideally the reserve price should reflect the expected revenues which are dependent on the location and user density.

***9. Is there a need for putting a maximum limit on the cumulative holding of spectrum acquired in these bands by a licensee and what should be that limit?***

The WiMAX Forum does not have a view on any award “Spectrum Cap” but since the spectrum is already limited in these three bands, the issue of a maximum limit on cumulative holding may not arise. However, the WiMAX Forum would like to reiterate its recommendation that each operator should be assigned a minimum of 30 MHz spectrum in lots of 5 or 10 MHz and to the extent possible, these lots should be contiguous.