

BASIC DETAILS

Consultation title: Crown Recognised Spectrum Access in 3400 to 3600 MHz

To (Ofcom contact): Cesar Gutierrez

Name of respondent: Barry Lewis

Representing (self or organisation/s): WiMAX Forum

Address (if not received by email):

CONFIDENTIALITY

Please tick below what part of your response you consider is confidential, giving your reasons why

Nothing	<input checked="" type="checkbox"/>	Name/contact details/job title	<input type="checkbox"/>
Whole response	<input type="checkbox"/>	Organisation	<input type="checkbox"/>
Part of the response	<input type="checkbox"/>	If there is no separate annex, which parts?	

If you want part of your response, your name or your organisation not to be published, can Ofcom still publish a reference to the contents of your response (including, for any confidential parts, a general summary that does not disclose the specific information or enable you to be identified)?

DECLARATION

I confirm that the correspondence supplied with this cover sheet is a formal consultation response that Ofcom can publish. However, in supplying this response, I understand that Ofcom may need to publish all responses, including those which are marked as confidential, in order to meet legal obligations. If I have sent my response by email, Ofcom can disregard any standard e-mail text about not disclosing email contents and attachments.

Ofcom seeks to publish responses on receipt. If your response is non-confidential (in whole or in part), and you would prefer us to publish your response only once the consultation has ended, please tick here.

Name Barry Lewis obo WiMAX Forum

Signed (if hard copy)

To: Ofcom

E-Mail: gutierrez@ofcom.org.uk

Ref:

Crown Recognised Spectrum Access in 3400 to 3600 MHz WiMAX Forum® Response

The WiMAX Forum^{®1} welcomes the opportunity to provide its views and comments concerning the public consultation identified above.

The WiMAX Forum is an industry-led, not-for-profit organisation formed to certify and promote the compatibility and interoperability of broadband wireless products based upon the harmonized IEEE 802.16/ETSI HiperMAN standard. A WiMAX Forum goal is to accelerate the introduction of these systems into the marketplace. WiMAX Forum Certified™ products are interoperable and support broadband fixed, portable and mobile services. Along these lines, the WiMAX Forum works closely with service providers and regulators to ensure that WiMAX Forum Certified systems meet customer and government requirements. For more information about the WiMAX Forum and its activities, please visit www.WiMAXForum.org.

In Annex 1, the WiMAX Forum is pleased to submit a response to the consultation document identified above.

Yours Sincerely

Tim Hewitt
WiMAX Forum
Chair - Regulatory Working Group

¹ "WiMAX," "Mobile WiMAX," "Fixed WiMAX," "WiMAX Forum," the WiMAX Forum logo, "WiMAX Forum Certified," and the WiMAX Forum Certified logo are trademarks of the WiMAX Forum.

Annex 1 WiMAX Forum Response

Extension of RSA to the 3400 to 3600 MHz band

Question 1: do you agree that we should introduce RSA in the 3400 to 3600 MHz?

YES.

The WiMAX Forum supports the introduction of RSA as this will boost the availability of spectrum for BWA use in the UK and is consistent with the goals of the European Commission Decision 2008/411/EC. The majority of European countries have already licensed this band for BWA services and adopted the channel arrangements recommended by ECC REC (04)05. The standards based WiMAX Certified products and the harmonised frequency band arrangements will facilitate device roaming across Europe. As a result deployment across Europe has been steadily increasing and the map below provides a snapshot of the current situation:



(The pin colour represents WiMAX technology based on IEEE802.16d - red or IEEE802.16e - blue)

The WiMAX Forum has put in place certification profiles, procedures and test laboratories that have been performing WiMAX Forum Certification for over two years. As a result, interoperable WiMAX Certified products are readily available and currently just under 50 products have been granted WiMAX Forum Certification in the 3400-3600 MHz frequency range.

Increased use of this spectrum could provide additional capacity will help fulfil the objectives of the Digital Britain initiative.

Question 2: do you agree that we should extend the relevant regulations to allow Crown bodies to be granted and to trade RSA in the 3400 – 3480 MHz and 3500 – 3580 MHz blocks? If not, which frequency ranges do you think the RSA regulations should cover and why?

YES we believe this will usefully add to the available spectrum.

Terms and conditions of the RSA grant and the WT licences

Question 3: do you agree that there should be no minimum trading unit for the RSA grant and the WT licences arising from trade in the band?

The WiMAX Forum proposes a minimum trading unit of 10MHz in order to encourage take up by BWA applications that can offer a truly broadband experience for the consumer.

Smaller trading units could result in fragmentation of the band and reduce the overall spectrum utility.

The WiMAX Forum expects that trading would facilitate aggregation of several minimum blocks into a contiguous overall block if desired.

Question 4: are there specific conditions that you consider should be included in RSA grants and WT licences arising from trading in the band?

The WiMAX Forum supports the technology neutral proposals to defining the RSA grants.

Technical limits for base stations in the 3500 – 3580 MHz block

Question 5: do you agree with the proposed in block emissions limit for base stations in the 3500 – 3580 MHz block?

YES – The WiMAX Forum supports the European Commission Decision 2008/411/EC for BWA in the 3.4 to 3.8 GHz band and the flexibility given to adjacent BWA operators to negotiate less stringent emissions. However these in-block emission limits should apply to base stations operating in the range 3400-3480 MHz too. TDD base stations could be deployed in this spectrum as well. It is not clear to the WiMAX Forum if this is the intention in the proposals contained in the consultation document.

Question 6: do you agree with the proposed out of block emissions mask at the 3500 MHz and 3580 MHz boundaries for base stations?

In principle the WiMAX Forum agrees that a block emission mask (BEM) is an accepted means to limit emissions into adjacent frequency blocks. However WiMAX Forum members offer the following observations which are a concern:

- a) Adjacent channels outside the RSA block (below 3500 and above 3580MHz) could become in effect “Restricted Usage Channels” in which an operator must accept an elevated level of potential interference². Recognising the legacy licence identified in the consultation document, this may introduce an unacceptable new constraint potentially affecting 50% of the legacy licence block.
- b) In addition, the same impact from the BEM at the 3480 MHz boundary could introduce the same condition into the other 50% of the legacy licence block between 3480MHz and 3500MHz.

Therefore the WiMAX Forum does not fully support the proposal from Ofcom and requests some further thought to help balance the need to limit out of block emissions against the constraints this places at the in block edges of operation.

A potential solution could be to apply the BEM at the following boundaries;

- a) 3475MHz
- b) 3505MHz
- c) 3575MHz

The lower frequency boundary is dependent upon decisions concerning the other services in the band.

Question 7: do you agree that less stringent technical parameters should be permitted if agreed between neighbouring operators?

YES. The WiMAX Forum agrees that specific coordination between operators can reduce the required stringency of mitigation measures and increased spectrum utility.

Question 8: should we align UK Broadband licence conditions for base stations at 3500 MHz and 3580 MHz with those in the RSA grants if and when UK Broadband

² See *Whereas* 8 in EC Decision 2008/477/EC which refers to Restricted BEM usage in the 2.6GHz band. Although not explicitly identified in the EC Decision 2008/411/EC, the effect of the BEM roll off into the adjacent licence block introducing an elevated risk of interference, is the same.

requests us to do so?

The WiMAX Forum does not believe that it is appropriate to identify a BEM at the 3500MHz or 3580MHz boundary as identified in the response to Q6 above. In addition the following observations are offered:

- a) The original legacy licence was awarded before the development of the BEM concept for improving technology neutral coexistence between FDD and TDD assignments.
- b) The BEM defined in the Decision and the Recommendation ECC REC(04)05 are based around the assumption that a licensed block contains both operational spectrum and internal guard frequency³. The internal guard frequency can be considered equivalent to the restricted channel identified for the 2.6GHz band in European Commission Decision 2008/477/EC.
- c) The WiMAX Forum is concerned if the utility of spectrum awarded to operators interested in delivering services using WiMAX technology is unnecessarily constrained by new adjacencies. Therefore the relationship between the BEM and an internal guard frequency should not be ignored.

Technical limits for terminal stations in the 3500 – 3580 MHz block

Question 9: do you agree with the proposed in block emissions limits for terminal stations?
YES.

Question 10: do you agree that the block edge mask should be based on the spectrum emissions mask from ETSI EN 302 623?

The WiMAX Forum believes that a regulatory BEM applied to terminal stations is an unnecessary regulation. In addition there is a danger that regulatory conditions in other countries and regions may vary leading to difficulties with mobile terminal roaming. The WiMAX Forum understands that the internal block edge guard band driven by the BEM applied to BS (under the correct conditions – i.e. accounting for internal guard frequency) automatically leads to emissions from the TS into an adjacent block that are below the maximum tolerable level.

Question 11: do you agree with our derivation of regulatory out of block limits for terminals and, if so, which of the proposed four alternative regulatory conditions do you think most appropriate?

The WiMAX Forum supports the view that operators should be encouraged to coordinate network deployment as this will maximise spectral efficiency. Options 1 & 2 impose a guard band irrespective of coordination between operators; whereas ECC DEC (07)02 is more flexible and allows the choice of other interference mitigation measures, other than imposing guard bands. This permits operators to make the maximum use of the available spectrum, by coordinating network deployments and synchronising with adjacent networks.

- Option 4 is our preferred choice for terminal equipment, i.e. these terminals are exempt from a terminal BEM as long as they comply with ETSI 302 326 as concluded in ECC REC (04)05. Option 4 is consistent with the observations made in the response to Q 10. However, the BS BEM needs to be set at the correct offset from the operational channel edges.

Question 12: should out of block limits for fixed, nomadic and mobile terminals be different?
No, the WiMAX Forum supports Option 4 above. Definition of a BEM for different categories of terminal station will be confusing for suppliers and customers, and could lead to uncertainty regarding the application of the regulation and complicate the possibilities for global roaming.

Question 13: should we align UK Broadband licence conditions for terminal stations

³ See *Considering m* and *Recommends 1* from ECC Recommendation(04)05.

at 3500 MHz and 3580 MHz with those in the RSA grants if and when UK Broadband requests us to do so?

The WiMAX Forum agrees that some conditions should be harmonised but does not support a terminal station BEM.

Technical limits at 3580 MHz

Question 14: do you agree that the technical limits at 3480 MHz should copy those at 3580 MHz when the use immediately below 3480 MHz is broadband wireless?

See the response to Q6.

In addition the WiMAX Forum fully supports the proposal to move the emergency services down to a lower part of the band to maintain a contiguous block for “BWA after trade” spectrum and the UKBB licence spectrum depicted in Fig 8.6.

Question 15: do you agree with the proposed technical limits at 3480 MHz for the scenario where the upper edge of the emergency services block does not change from the current allocation at 3475 MHz?

The WiMAX Forum observes that the emission levels above 3480MHz remain unchanged from the existing licence conditions. However the WiMAX Forum prefers relocation of the emergency services to a lower part of the band.

Question 16: do you agree with the proposed technical limits at 3480 MHz for the scenario where the upper edge of the emergency services block is moved to 3480 MHz?

The WiMAX Forum remains neutral on this point.

Technical limits inside the RSA blocks after a partial trade

Question 17: do you agree that the technical conditions of the RSA grant at the 3500 MHz and 3580 MHz boundaries are the best option for the boundaries that will appear inside the 3500 – 3580 MHz block if the block is partitioned and traded into several smaller sub-blocks?

Yes but in a multi-operator scenario, the WiMAX Forum reiterates that proper account must be taken of the BEM and internal guard frequency aspect and this should be made clear to those interested in RSA grants when assessing their spectrum requirements.

Question 18: do you think that the out of block limits for broadband wireless base stations in Figure 8.2 are sufficient to protect air-to-ground videolink receivers in an adjacent block?

The WiMAX Forum has no view on the protection required by emergency service applications. However, where possible, consistent BEM requirements are desirable to minimise variations.

Question 19: what are your views on the requirements for protection of air-to-ground videolink receivers from interference from broadband wireless terminals?

The WiMAX Forum has no view on the protection required by emergency service applications. However, where possible, consistent BEM requirements are desirable to minimise variations.

Question 20: do you think that an out of block requirement for airborne videolink transmitters of -25 dBm/MHz EIRP is sufficient to protect broadband wireless receivers?

The WiMAX Forum does not have access to precise studies on this topic. However typical base station antennas for sectorial coverage can exhibit considerable rejection (perhaps more than 25dB) at elevation angles above around 20degrees which may offer helpful isolation.