Commission for
Communications Regulation

Submissions to Consultation

Release of Spectrum in the 2300 – 2400 MHz band

Submissions received from respondents

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Release of Spectrum in the 2300 – 2400 MHz band.

Reference : Submission re ComReg 09/49

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Q.1. ComReg's proposes to release spectrum for licensing additional services in the 2.3 GHz band. Do you support ComReg's proposal to release spectrum in the band? Are there other issues, besides those identified above, which ComReg's needs to take into account in releasing spectrum in the band? Please give reasons for your answer.

We agree with ComReg's proposal to release the spectrum in the 2.3Ghz band.

Q. 2. Which of the license types outlined above, in your view are the most appropriate for the 2.3 GHz band: national, regional , local or closed user group? Please cite reasons for your answer.

The license type in our view that would be most appropriate is a national license for use by closed user groups. Interconnectivity for data, voice and video for example. The reason is availability of spectrum for point to point and multi point systems is open to all. If the 2.3 G band was available on a license national channel a number of issues with other bands like the 5.8G band would be eliminated.

Q. 3. Do you believe there is a possibility for a combination of all or some of the above in the 2.3 GHz band and, if so, in what way? Please set out your suggested approach.

A combination is possible however it is best if the band is allocated nationally.

Q. 4. If you believe that there should be a combination of license types in this band, how much spectrum should be allocated to each of the license types defined in Question 2? For example, if you recommend in response to Question 2 that spectrum should be released on a national and regional basis, how much spectrum should be allocated to each license type? Please give reasons for your answer.

A national spectrum allocation of at least 60Mhz is required. Allowing for a combination of 3 x 20Mhz channels in all areas.

Q. 5. If you believe that licenses in this band should be offered on a regional basis, on what basis should ComReg's determine the regions, e.g. provinces, groups of counties? Please support your response as appropriate.

N/A

Q. 6. If you believe Local Area licenses to be the superior choice, what geographic area should these licenses incorporate and on what basis? (For example, FWALA licenses incorporate service area 20km from defined centre point of license). What conditions should ComReg's implement to mitigate potential interference between users using the same spectrum in adjacent geographical areas?

N/A

Q. 7. In order to protect current users of the 2.3 GHz band, ComReg's proposes that any potential licenses offered in the range 2300 – 2330 MHz would be released on the basis of local area or closed user group licenses only. Do you agree with this proposal? If not, please give reasons for your answer.

If a national license for spectrum is offered the existing spectrum in use should not be allocated. This spectrum could be used for other regional and local uses.

Q. 8. Do you agree with ComReg's proposal that if this spectrum is offered on a national and/or regional basis, it should be by means of an auction or auctions? Do you agree with ComReg's proposal to release any spectrum for local area licensing under a beauty competition? Please supply reasons to support your response.

We agree that the spectrum is offered by means of auction with special consideration given to closed user groups.

Q. 9. Do you agree with ComReg's proposal to use benchmarking to assist in setting a fair license fee for the spectrum? Alternatively, do you believe there is an alternative, superior method of setting the fees? Please supply reasons to support your response.

We consider usage license fees the most appropriate form of licensing.

Q. 10. Do you agree with ComReg's proposal to make license duration of spectrum in the 2.3 GHz band between 10 - 15 years long? Please supply reasons to support your response.

We agree that the license should be available for 15 years as long as it is in use. This will allow for planning of services on the band.

Q. 11. Do you agree with ComReg's proposal to limit the amount of spectrum available to any given operator to 30 MHz for a given area? Please supply reasons to support your response.

If a national license is considered then 30Mhz is restrictive for planning of services as it will not facilitate high capacity links requiring 20Mhz of spectrum.

Q. 12. Do you agree with ComReg's proposal to attach utility conditions to any potential licenses in this band? If not, why? Please provide reasons for your answers.

Yes

Q. 13. In your view what would be the most appropriate channel spacing for the 2.3 GHz band? Please give detailed reasons for you answer.

It should be allocated in blocks of at least 60Mhz preferably 100Mhz and freedom given to user to allocate channel spacing as they see fit.

Q. 14. Do you support ComReg's proposed power limit? If not, please set out the reasons for your answer.

Yes

Q. 15. Do you agree with ComReg's proposal to adapt the Block Edge Mask that applies to the 2500 – 2690 MHz band to the 2.3 GHz band, once a channel bandwidth has been agreed? Please provide reasons to support your response.

Yes we agree with the proposal.

Q. 16. Do you agree with ComReg's proposal to impose the unwanted emission limits detailed above? Please provide reasons to support your response.

Yes we agree with the proposal

2 BT Communications Ireland Limited

BT Communications Ireland Limited Response to ComReg Consultation Paper: ComReg 09/49

Release of Spectrum in the 2300 – 2400 MHz band

Issue 1
29th July 2009

Introduction

BT welcomes the opportunity to comment and for ease of reading has repeated the ComReg questions with its answers.

Detailed Response

Q. 1. ComReg proposes to release spectrum for licensing additional services in the 2.3 GHz band. Do you support ComReg's proposal to release spectrum in the band?
A. 1a. Yes. BT believes unused spectrum should be released to market as soon as possible. The ITU have identified this band as a band for IMT and the band is already used for mobile services in other countries, for example China and South Korea. Within Europe, Norway has already issued mobile licences in this band, the Swedish Administration has indicated its intention to make the band available for mobile services by 2012 and within the UK the MoD has discussed releasing/sharing some of this spectrum beyond November 2012[1]. Given the proposals in the UK, BT suggests that it would be worth ComReg exploring if any spectrum available might be made available on an all-Ireland basis.

Are there other issues, besides those identified above, which ComReg needs to take into account in releasing spectrum in the band? Please give reasons for your answer.
A. 1b. No.

Q. 2. Which of the licence types outlined above, in your view are the most appropriate for the 2.3 GHz band: national, regional, local or closed user group? Please cite reasons for your answer.
A. 2. Where possible national licenses should preferably be awarded. However, where part of the spectrum is not available for release as a national license it could be awarded on a geographically restricted basis to avoid areas and frequencies which have existing use. The ComReg map of current 2300 MHz band use indicates that it is currently used in 4 areas/clusters, leaving the majority of the country free for regional licences.

We believe that regional licences are preferable to local licences, as this would make for easier co-ordination between licence holders, and would also likely result in better coverage for the customers.

In summary, we support regional licences for 2300 – 2330 MHz, and national licences for 2330 – 2400 MHz.

Q. 3. Do you believe there is a possibility for a combination of all or some of the above in the 2.3 GHz band and, if so, in what way? Please set out your suggested approach.
A. 3. See A. 2. above.

Q. 4. If you believe that there should be a combination of licence types in this band, how much spectrum should be allocated to each of the licence

[1] See http://www.mod.uk/NR/rdonlyres/40622FC9-DC7B-40FC-B48A-90408F6F7676/0/spectrumstatement_051208.pdf

types defined in Question 2? For example, if you recommend in response to Question 2 that spectrum should be released on a national and regional basis, how much spectrum should be allocated to each licence type? Please give reasons for your answer.
A. 4. See A. 2. above.

Q. 5. If you believe that licences in this band should be offered on a regional basis, on what basis should ComReg determine the regions, e.g. provinces, groups of counties? Please support your response as appropriate.
A. 5. Regional spectrum should be offered over as large an area as possible that would be consistent with existing use.

Q. 6. If you believe Local Area licences to be the superior choice, what geographic area should these licences incorporate and on what basis? (For example, FWALA licences incorporate service area 20km from defined centre point of licence). What conditions should ComReg implement to mitigate potential interference between users using the same spectrum in adjacent geographical areas?
A. 6. BT does not believe local area licenses to be the superior choice.

Q. 7. In order to protect current users of the 2.3 GHz band, ComReg proposes that any potential licences offered in the range 2300 – 2330 MHz would be released on the basis of local area or closed user group licences only. Do you agree with this proposal? If not, please give reasons for your answer.
A. 7. BT believes that spectrum should be issued nationwide except where spectrum already in use as indicated in the consultation document.

Q. 8. Do you agree with ComReg's proposal that if this spectrum is offered on a national and/or regional basis, it should be by means of an auction or auctions?
A. 8a. BT generally supports suitably designed auctions as fair, transparent and non-discriminatory mechanisms for spectrum release.

Do you agree with ComReg's proposal to release any spectrum for local area licensing under a beauty competition? Please supply reasons to support your response.
A. 8b. BT is unclear as to why ComReg has concluded that a beauty contest is preferable to auction for local area licensing. However, in the event of a beauty contest such should be based on open and fair criteria and the selection process should be transparent.

Q. 9. Do you agree with ComReg's proposal to use benchmarking to assist in setting a fair licence fee for the spectrum? Alternatively, do you believe there is an alternative, superior method of setting the fees? Please supply reasons to support your response.
A. 9. BT is unclear around ComReg's proposition to hold an auction for the spectrum and yet also require a license fee from the winning bidder. It is our understanding that national regulators normally either charge an auction fee, which applies for the duration of the licence, *or* an annual licence fee, but not normally both fees.

Q. 10. Do you agree with ComReg's proposal to make licence duration of spectrum in the 2.3 GHz band between 10 - 15 years long? Please supply reasons to support your response.

A. 10. There is a dependency on whether Ireland introduces spectrum trading or not as to how long the licence should run for. That aside BT believes that a minimum term of 15 years seems reasonable for this band. It should be made clear to potential bidders as to what happens at ends of that term i.e. will the licence holder have the opportunity to apply for an extension before the licence has expired, or does the spectrum become subject of re-auction, or additional fees. BT also believes that it should be clarified whether the licence will be tradable in whole or part (in frequency and geography)."

Q. 11. Do you agree with ComReg's proposal to limit the amount of spectrum available to any given operator to 30 MHz for a given area? Please supply reasons to support your response.
A. 11. BT does not have a definitive position on minimum spectrum holding at present but could foresee a requirement greater than 30MHz being proposed. This may be particularly true in case of operators who don't have holdings in other bands which could be used in conjunction with this spectrum.

It is implicit (although not stated) that the spectrum will be used for TDD operation. As discussed further under Q15, it is proposed that the 2.6 GHz Block Edge Masks should be applied, in which case the spectrum holding would probably need to include a 5 MHz restricted block. Therefore it should be recognised that licences will normally include 5 MHz of "less usable" spectrum, and hence the spectrum holdings should be dimensioned to take this into account.

In the consultation document ComReg has discussed caps on holdings within this band. However, in practice this spectrum may be used in conjunction with spectrum from other bands. Hence, it may be sensible to look at caps across multiple bands; as proposed in UK as part of Digital Britain initiative.

Q. 12. Do you agree with ComReg's proposal to attach utility conditions to any potential licences in this band? If not, why? Please provide reasons for your answers.
A.12. In the absence of ability to trade spectrum BT accepts that some utility conditions could be appropriate to avoid spectrum hoarding.

Q. 13. In your view what would be the most appropriate channel spacing for the 2.3 GHz band? Please give detailed reasons for you answer.
A. 13. 5MHz blocks appear sensible. We note new technologies e.g. LTE & WIMAX offering a range of channel bandwidths. BT suggests spectrum made available in 5MHz blocks as this would perhaps give maximum flexibility.

Q. 14. Do you support ComReg's proposed power limit? If not, please set out the reasons for your answer.
A. 14. BT does not have firm views on this matter at this stage. However, BT is unclear as to why ComReg has proposed these particular figures.

It may be appropriate to set power limits similar to those in the nearby 2.6GHz band (as per EC decision and CEPT studies for that band).

Q. 15. Do you agree with ComReg's proposal to adapt the Block Edge Mask that applies to the 2500 – 2690 MHz band to the 2.3 GHz band, once a channel bandwidth has been agreed? Please provide reasons to support your response.

A. 15. BT agrees that the 2.6 GHz block edge mask (BEM) would be a good starting point for discussions on usage of this band. However, BT has not studied this band and may give a different opinion at a later stage.

We do however note that Annex B, which appears to be an excerpt from (a draft version of) CEPT Report 19, seems to be incomplete, and would need some additional explanation. It is implicit (although not stated) that the licences would be offered for TDD operation. Therefore we believe that the BEMs should include the "restricted block" which is an essential requirement between two un-coordinated TDD operators. (As noted above under Q 11, this also impacts on the size of spectrum holding.) Therefore it is necessary to define those parts of the BEM which apply for TDD operation, including the restricted block, which is not mentioned in Annex B.

Q. 16. Do you agree with ComReg's proposal to impose the unwanted emission limits detailed above? Please provide reasons to support your response.

A. 16. BT does not have a firm view on this matter but we believe the ITU recommendations should provide a good starting point for discussions.

3 Digiweb

Q. 1. ComReg proposes to release spectrum for licensing additional services in the 2.3 GHz band. Do you support ComReg's proposal to release spectrum in the band? Are there other issues, besides those identified above, which ComReg needs to take into account in releasing spectrum in the band? Please give reasons for your answer.

Digiweb support ComReg's proposal to release the 2.3 GHz spectrum. However, the Company is concerned over the likely delays from the ETSI BRAN in issuing SRDoc by early 2010.

Q. 2. Which of the licence types outlined above, in your view are the most appropriate for the 2.3 GHz band: national, regional, local or closed user group? Please cite reasons for your answer.

Digiweb believe that ComReg should proposed 2 to 3 National licences in the band 2330-2400 MHz. The remainder of the band, less than 2.33 GHz could be issued using a FWALA scheme local area scenario.

ComReg should consider the global "spectrum offering" already in place for the provision of Mobile Broadband services. The introduction of the 2.3 GHz band would have an impact on Broadband market countrywide only if those new licences are being issued nationally. A national licence will allow 2.3 GHz holders to compete effectively with Mobile Network Operators, thereby strengthening competition.

The creation of Local/Regional licence will possibly promote the development of micro-providers, but those new players won't have the ability to have a true impact on the market.

Q. 3. Do you believe there is a possibility for a combination of all or some of the above in the 2.3 GHz band and, if so, in what way? Please set out your suggested approach.

Digiweb believe there is no choice but to combine Local licences for the band under 2,330 MHz and National licences over 2,330 MHz

Q. 4. If you believe that there should be a combination of licence types in this band, how much spectrum should be allocated to each of the licence types defined in Question 2? For example, if you recommend in response to Question 2 that spectrum should be released on a national and regional basis, how much spectrum should be allocated to each licence type? Please give reasons for your answer.

Two National licences of 30 MHz TDD or FDD should be issued under the band 2,330-2,400 MHz. One bock of 30 MHz should be issued locally for the band 2,300-2,330 MHz.

Q. 5. If you believe that licences in this band should be offered on a regional basis, on what basis should ComReg determine the regions, e.g. provinces, groups of counties? Please support your response as appropriate.

No comment.

Q. 6. If you believe Local Area licences to be the superior choice, what geographic area should these licences incorporate and on what basis? (For example, FWALA licences incorporate service area 20km from defined centre point of licence). What conditions should ComReg implement to mitigate potential interference between users using the same spectrum in adjacent geographical areas?

Digiweb consider that the FWALA scheme is suited for the band 2,300-2,330 MHz. As per the interference contours between users, the Company cannot make any comment without knowing EIRP levels allowed in Rurtel and Dail TV base stations. Digiweb would favor the option of the extension of the service area range.

Q. 7. In order to protect current users of the 2.3 GHz band, ComReg proposes that any potential licences offered in the range 2300 – 2330 MHz would be released on the basis of local area or closed user group licences only. Do you agree with this proposal? If not, please give reasons for your answer.

Digiweb agree with the proposal.

Q. 8. Do you agree with ComReg's proposal that if this spectrum is offered on a national and/or regional basis, it should be by means of an auction or auctions? Do you agree with ComReg's proposal to release any spectrum for local area licensing under a beauty competition? Please supply reasons to support your response.

Digiweb agree with ComReg's proposal to offer National spectrum by the means of auctions. Digiweb also agree with the use of Beauty contest competition for local area licensing.

Q. 9. Do you agree with ComReg's proposal to use benchmarking to assist in setting a fair licence fee for the spectrum? Alternatively, do you believe there is an alternative, superior method of setting the fees? Please supply reasons to support your response.

Digiweb agree with the use of benchmarking in order to establish the minimum licence fee for the spectrum.

Q. 10. Do you agree with ComReg's proposal to make licence duration of spectrum in the 2.3 GHz band between 10 - 15 years long? Please supply reasons to support your response.

Digiweb advise ComReg to extend the duration of those licences to 20 years. By doing so, the Regulator will effectively maximize the chance for the licence holder to make a return on investments. A 20 years licence will also increase the value of the band.

Q. 11. Do you agree with ComReg's proposal to limit the amount of spectrum available to any given operator to 30 MHz for a given area? Please supply reasons to support your response.

Digiweb support Comreg's suggestion.

Q. 12. Do you agree with ComReg's proposal to attach utility conditions to any potential licences in this band? If not, why? Please provide reasons for your answers.

Digiweb should let the market maximize the use of the spectrum by allowing for the licence to be tradable.

Q. 13. In your view what would be the most appropriate channel spacing for the 2.3 GHz band? Please give detailed reasons for you answer.

Digiweb suggest to issue two licence blocks of 32 MHz on the 2,330-2,400 MHz. The remaining 3 MHz would be used to separate both licences and the adjacent bands. Digiweb also propose to issue the totality of the 30 MHz band within one blocks at the 2,300-2,330 MHz.

Q. 14. Do you support ComReg's proposed power limit? If not, please set out the reasons for your answer.

Digiweb support ComReg's proposed power limit.

Q. 15. Do you agree with ComReg's proposal to adapt the Block Edge Mask that applies to the 2500 – 2690 MHz band to the 2.3 GHz band, once a channel bandwidth has been agreed? Please provide reasons to support your response.

No Comment.

Q. 16. Do you agree with ComReg's proposal to impose the unwanted emission limits detailed above? Please provide reasons to support your response.

No comment.

4 eircom

eircom Ltd.

Response to ComReg Doc. 09/49

Consultation on Release of Spectrum in the 2300 – 2400 MHz band. Proposed Options & License Conditions

29 Jul 2009

DOCUMENT CONTROL

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EXECUTIVE SUMMARY

• eircom regards radio spectrum as a key enabler for the Irish economy. It provides a significant contribution to the economy in terms of both GDP and employment and in the future it will play an increasingly important role in its contribution to competitiveness. It is imperative that the maximum benefit is derived from available spectrum. The most efficient use of spectrum is to deploy spectrum efficient technologies, with future proofed broadband capabilities, serving near national target market, leveraging economies of scale (due to European harmonisation of the spectrum in question).

• The ITU have identified the 2.3 GHz band for IMT, just as was done for the 2.6 GHz band. ComReg needs to ensure that early release of this spectrum does not put Ireland at a disadvantage in terms of spectrum available for IMT. Use of MMDS in the 2.6 GHz band, while technically complying with the EC directive on ECS at 2.6 GHz, has left Ireland at a disadvantage in terms of spectrum availability for IMT expansion. It is imperative that a rush to release spectrum at 2.3 GHz does not negatively impact future IMT use of this band.

• Therefore, the allocation of spectrum in the 2.3 – 2.4 GHz band must
  a) be aligned with the EU plans for this band and should wait until the work CEPT/ETSI has undertaken to harmonise the spectrum in Europe has been completed
  b) provide users with the correct incentives for efficient use of that spectrum.
  c) ensure that existing licensed users of the spectrum are protected from harmful interference

Possible Licence Type Options

• eircom believes that a when the ETSI BRAN (Broadband Radio Access Networks) has developed their Systems Reference Document (SRDoc), on "Broadband Wireless Systems in the frequency range 2300 MHz to 2400 MHz range" by early 2010, the spectrum should be awarded on a local area and closed user group basis for 2300-2330 MHz band, and on a national and regional basis for 2330-2400 MHz.

• Conditions applied to licences, such as geographical coverage and utility conditions, need to take into account the standardisation, harmonisation and maturity of solutions associated with the released spectrum. For example, if spectrum was released in 2010, ETSI will only be supplying the base information for harmonisation in 2010, and technologies such as LTE, in this band, will probably only become available in early 2011. Hence, initial rollout conditions should take these factors into account.

Possible Award Process Options

• Both beauty contest and auction procedures have advantages and disadvantages and thus the use of either one of the procedures will depend on an a-priori analysis of which is most likely to provide the required result in as efficient a manner as possible under the particular circumstances that apply. In choosing one over the other ComReg must ensure that the strategic objectives mentioned below are achieved. The basic objectives of spectrum allocation in the 2.3-2.4 GHz band must ensure that:
- requirements for efficient spectrum use apply equally to all spectrum users;
- spectrum should be made available to users at the least cost possible;

• There is also a case for harmonising guidelines across Europe for licence award process for this spectrum through the development of a common set of principles to describe the criteria

underlying which assignment procedure is appropriate. Indeed the approach of developing a hybrid auction/beauty contest could also be considered.

Licence Duration

- eircom believes that ComReg should consider indefinite duration licences this would encourage the Licensee to continue to invest in their network and would avoid a repeat of the current difficulty where existing and essential services in the 900 & 1800 MHz bands are facing licence expiry.

- While legislation is required to enable spectrum trading, ComReg should consider aligning the availability of this spectrum with expected changes to legislation, which will support Spectrum trading.

Spectrum Cap

- eircom supports, in principle, the proposal to limit the amount of spectrum that one licensee can hold in a particular geographical area covered by the licence type, ensuring equitable access to a valuable resource. The actual size of the CAP should be influenced by the number of operators seeking access to the band. While 70 MHz of spectrum is significant for regional/national applications, it is still only similar to the amount of spectrum that ComReg is currently consulting on in the 900 MHz consultation. In the 900/1800 MHz consultation, ComReg is proposing a 20 MHz (2 x 10 MHz) cap for operators in the 900 MHz band (2 x 35 MHz in total). The same drivers for a 20 MHz cap also exist for the 2.3 GHz band and ComReg should consider a similar size cap to ensure equitable access to spectrum for a number of operators.

- Similar considerations will be required for the Digital Dividend, where 790 – 862 MHz is becoming the converged view on the EU harmonised band for the Digital Dividend.

- eircom agrees that this spectrum cap would only apply for any new licences issued in the band, i.e. licensees of the Dáil TV and Rurtel applications would be eligible to acquire spectrum up to the maximum value not exceeding the agreed cap

Utility Conditions

- Conditions applied to licences, such as geographical coverage and utility conditions, need to take into account the standardisation, harmonisation and maturity of solutions associated with the released spectrum.

- For example, if spectrum was released as early as 2010 by ComReg, ETSI would only then be supplying the base information for harmonisation in 2010, and technologies such as LTE, will probably only become available in early 2011 in this band.

- Hence, initial rollout conditions should take these constraints and risks into account.

- Prior to the licensee "losing" the spectrum they should be afforded the opportunity to apply for an alternative licence type.

Technical Considerations

- eircom strongly suggests that ComReg should wait until ETSI SRDoc is completed in 2010, by which time there may be a basis for harmonised use of this band across Europe. Important

guidelines are required on Duplexing method (TDD or FDD), channel sizes and channel spacing, Block Edge Mask etc

- eircom agrees in principle with proposal to use a Block Edge Mask similar to the one used for the 2.6 GHz band, but the actual BEM used should be one that applies across Europe and has been agreed and adopted by CEPT.

- It is worrying that ComReg are proposing to release this spectrum without a channel plan, but reserve the right to impose aan ITU channel plan when/if it becomes available.

- Ireland's population is too small to drive the economies of scale for a mass mobile broadband solution, hence it would be better to keep this spectrum free until such mobile broadband solution is available for deployment on a large global scale, which Ireland can then deploy with a higher certainty of benefit to a significant number of consumers.

RESPONSE TO CONSULTATION QUESTIONS

Q. 1. ComReg proposes to release spectrum for licensing additional services in the 2.3 GHz band. Do you support ComReg's proposal to release spectrum in the band? Are there other issues, besides those identified above, which ComReg needs to take into account in releasing spectrum in the band? Please give reasons for your answer.

eircom supports ComReg's efforts to release spectrum for additional services. It is important to consult with Industry on the best approach and timing for the release of this spectrum. In order to gain the maximum benefit, it would be best to ensure that sufficient spectrum will be available for IMT (as per WRC -07) on a regional or national basis.

It is strongly recommended that ComReg should wait until ETSI SRDoc is completed in 2010, and there is a basis for harmonised use of this band across Europe, before releasing this spectrum.

By deploying MMDS is the 2.6 GHz band, it has limited Ireland's access to this band for IMT expansion. Care is required to ensure that early deployment of non standardised solutions, may limit access to another IMT expansion band.

In addition, LTE equipment will only becoming available in early 2011, in TDD format. Operators require mature and robust technology for commercial deployments and so it would be risky to deploy LTE in the 2.3 GHz band too soon.

Q. 2. Which of the licence types outlined above, in your view are the most appropriate for the 2.3 GHz band: national, regional, local or closed user group? Please cite reasons for your answer

The spectrum should be awarded on a local area and closed user group basis for 2300-2330 MHz band and on a national and regional basis for 2330-2400 MHz.

Q. 3. Do you believe there is a possibility for a combination of all or some of the above in the 2.3 GHz band and, if so, in what way? Please set out your suggested approach.

Due to the existing use of the 2.3 GHz band, it seems most efficient to use a local area and closed user group basis for 2300-2330 MHz band, and on a national and regional basis for 2330-2400 MHz. As indicated by ComReg, appropriate guard bands (frequency and spatial separation) must be used to protect existing users of this spectrum.

Q. 4. If you believe that there should be a combination of licence types in this band, how much spectrum should be allocated to each of the licence types defined in Question 2? For example, if you recommend in response to Question 2 that spectrum should be released on a national and regional basis, how much spectrum should be allocated to each licence type? Please give reasons for your answer

Please see answer to Q2 and Q3

Q. 5. If you believe that licences in this band should be offered on a regional basis, on what basis should ComReg determine the regions, e.g. provinces, groups of counties? Please support your response as appropriate.

The regions should be selected to give maximum population and area coverage.

Q. 6. If you believe Local Area licences to be the superior choice, what geographic area should these licences incorporate and on what basis? (For example, FWALA licences incorporate service area 20km from defined centre point of licence). What conditions should ComReg implement to mitigate potential interference between users using the same spectrum in adjacent geographical areas?

As FWALA has been in existence since 2003, it would seem logical to implement the same procedures already implemented by ComReg for the 3.4 to 3.8 GHz band

Q. 7. In order to protect current users of the 2.3 GHz band, ComReg proposes that any potential licences offered in the range 2300 – 2330 MHz would be released on the basis of local area or closed user group licences only. Do you agree with this proposal? If not, please give reasons for your answer.

eircom agrees with this proposal, however it is important that current users are protected from interference. In particular, the Rurtel solution is FDD based, hence if TDD systems are working along side the Rurtel assigned spectrum, a guardband of at least 5 MHz is required (as per recommendations for BEM in 2.5 GHz band

The coverage maps for Rurtel on the ComReg site appear to be missing Rurtel locations in the centre of the country.

Attached find co-ordinates for these 5 base-stations, which can be added onto ComReg for map/analysis inclusion.

Location	Eastings	Northings
Croghan Hill	24715	23325
Clonmore	24130	22450
Ballycommon	24190	22810
Oughter	22020	22320
Pollagh	21790	22475

Q. 8. Do you agree with ComReg's proposal that if this spectrum is offered on a national and/or regional basis, it should be by means of an auction or auctions? Do you agree with ComReg's proposal to release any spectrum for local area licensing under a beauty competition? Please supply reasons to support your response.

Both beauty contest and auction procedures have advantages and disadvantages and thus the use of either one of the procedures will depend on a-priori analysis of which is most likely to provide the required result in as efficient a manner as possible under the particular circumstances that apply. In choosing one over the other ComReg must ensure that the strategic objectives mentioned below are achieved. The basic objectives of spectrum allocation in the 2.3-2.4 GHz band must ensure that:

- requirements for efficient spectrum use apply equally to all spectrum users;
- spectrum should be made available to users at the least cost possible;

There is also a case for harmonising guidelines across Europe for licence award process for this spectrum through the development of a common set of principles to describe the criteria underlying which assignment procedure is appropriate. Indeed the approach of developing a hybrid auction/beauty contest could also be considered.

Q. 9. Do you agree with ComReg's proposal to use benchmarking to assist in setting a fair licence fee for the spectrum? Alternatively, do you believe there is an alternative, superior method of setting the fees? Please supply reasons to support your response.

Please see answer to Q8, the licence fee should support the strategic objectives as set out above.

Benchmarking across Europe would provide an input into setting a fair licence fee that could be used for this spectrum in Ireland. Other inputs could be the price of licence fees that are currently being paid for similar spectrum, the costs to rollout and manage a network, the benefit of the services that could be deployed over the spectrum etc.

Q. 10. Do you agree with ComReg's proposal to make licence duration of spectrum in the 2.3 GHz band between 10 - 15 years long? Please supply reasons to support your response.

eircom believes that ComReg should consider indefinite duration licences this would encourage the Licensee to continue to invest in their network and would avoid a repeat of the current difficulty where existing and essential services in the 900 & 1800 MHz bands are facing licence expiry.

While legislation is required to enable spectrum trading, ComReg should consider aligning the availability of this spectrum with expected changes to legislation, which will support Spectrum trading.

Q. 11. Do you agree with ComReg's proposal to limit the amount of spectrum available to any given operator to 30 MHz for a given area? Please supply reasons to support your response.

eircom supports, in principle, the proposal to limit the amount of spectrum that one licensee can hold in a particular geographical area covered by the licence type, ensuring equitable access to a valuable resource.. The actual size of the CAP should be influenced by the number of operators seeking access to the band. While 70 MHz of spectrum is significant for regional/national applications, it is still only similar to the amount of spectrum that ComReg is currently consulting on in the 900 MHz consultation. In the 900/1800 MHz consultation, ComReg is proposing a 20 MHz (2 x 10 MHz) cap for operators in the 900 MHz band (2 x 35 MHz in total). The same drivers for a 20 MHz cap also exist for the 2.3 GHz band and ComReg should consider a similar size cap to ensure equitable access to spectrum for a number of operators.

Similar considerations will be required for the Digital Dividend, where 790 – 862 MHz is becoming the converged view on the EU harmonised band for the Digital Dividend.

eircom agrees that this spectrum cap would only apply for any new licences issued in the band, i.e. licensees of the Dáil TV and Rurtel applications would be eligible to acquire spectrum up to the maximum value not exceeding the agreed cap

Q. 12. Do you agree with ComReg's proposal to attach utility conditions to any potential licences in this band? If not, why? Please provide reasons for your answers.

Conditions applied to licences, such as geographical coverage and utility conditions, need to take into account the standardisation, harmonisation and maturity of solutions associated with the released spectrum.

For example, if spectrum was released as early as 2010 by ComReg, ETSI would only then be supplying the base information for harmonisation in 2010, and technologies such as LTE, will probably only become available in early 2011 in this band.

Hence, initial rollout or utility conditions should take these constraints and risks into account.

Q. 13. In your view what would be the most appropriate channel spacing for the 2.3 GHz band? Please give detailed reasons for you answer.

eircom strongly suggests that ComReg should wait until ETSI SRDoc is completed in 2010, by which time there may be a basis for harmonised use of this band across Europe. Important guidelines are required on Duplexing method (TDD or FDD) , channel sizes and channel spacing, Block Edge Mask etc

eircom agrees in principle with proposal to use a Block Edge Mask similar to the one used for the 2.6 GHz band, but the actual BEM used should be one that applies across Europe and has been agreed and adopted by CEPT.

It is worrying that ComReg are proposing to release this spectrum without a channel plan, but reserve the right to impose an ITU channel plan when/if it becomes available.

Ireland's population is too small to drive the economies of scale for a mass mobile broadband solution, hence it would be better to keep this spectrum free until such mobile broadband solution is available for deployment on a large global scale, which Ireland can then deploy with a higher certainty of benefit to a significant number of consumers.

By deploying MMDS is the 2.6 GHz band, it has limited Ireland's access to this band for IMT expansion. Care is required to ensure that early deployment of non standardised solutions, may limit access to another IMT expansion band ie the 2.3 GHz band

Notwithstanding the above, the trend for mobile BB systems is that assigned blocks are in multiples of 5 MHz.

Q. 14. Do you support ComReg's proposed power limit? If not, please set out the reasons for your answer.

See answer to Q13 plus the following

The power levels proposed seem different to the BEM in the annex to Commission Decision 2008/477/EC (Commission Decision on the harmonisation of the 2500 – 2690 MHz frequency band for terrestrial systems capable of providing electronic communications services in the Community)

Eg

200W BS EIRP is equivalent to 53 dBm, while the BEM in 2008/477/EC is 61 dBm in 5 Mhz
25 W (fixed terminal) is 44 dBm, while the BEM in 2008/477/EC is 35 dBm in 5 Mhz
5W (mobile terminal) is 37 dBm, while the BEM in 2008/477/EC is 35 dBm in 5 Mhz

Q. 15. Do you agree with ComReg's proposal to adapt the Block Edge Mask that applies to the 2500 – 2690 MHz band to the 2.3 GHz band, once a channel bandwidth has been agreed? Please provide reasons to support your response.

See answer to question 13.

In addition ComReg's proposal poses an unfair risk on any operator who deploys a network in good faith, that ComReg reserves the right to then change the conditions to match any future ETSI standards

Q. 16. Do you agree with ComReg's proposal to impose the unwanted emission limits detailed above? Please provide reasons to support your response.

See answer to question 13.

In addition ComReg's proposal poses an unfair risk on any operator who deploys a network in good faith, that ComReg reserves the right to then change the conditions to match any future ETSI standards

5 Ericsson

Release of Spectrum in the Band 2300MHz-2400MHz

Ericsson's Response to ComReg Consultation Document 09/49

April 2009

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1. General comments

LM Ericsson ("Ericsson") welcomes the opportunity to comment on ComReg's consultation on the release of spectrum in the 2300-2400MHz band.

Ericsson shares ComReg's view with regard to spectrum below 4GHz being optimal for mobile wireless services. Developments in the 2300-2400MHz would suggest that it is likely to become an important band in the context of mobile broadband and a valuable addition to the spectrums allocated for mobile wireless services.

As ComReg pointed out there is still a lot of work to be completed with regard to harmonisation and technical parameters applicable to the 2300-2400MHz band across a number of industry groups, but we welcome ComReg's forward thinking in consulting with the industry at this early stage.

2. Answers to Questions

List of Questions

Q. 1. ComReg proposes to release spectrum for licensing additional services in the 2.3 GHz band.
a.) Do you support ComReg's proposal to release spectrum in the band?
b.) Are there other issues, besides those identified above, which ComReg needs to take into account in releasing spectrum in the band? Please give reasons for your answer.

a.) Yes.

b.) Yes, Ericsson believes that there are a number of considerations that ComReg should address before deciding on releasing the spectrum.

Interference

There are a number of interference cases that need to be considered at the borders of the 2.3GHz band.
A.) LTE/WiMax interference case at the upper end of the 2.3GHz band with WiFi devices. Ericsson is of the view that further studies are needed, but early indications are that an additional filter of the order of 20-30 dB to protect RLAN is needed on

the LTE/WiMAX base stations (BS) together with a guard band of 10 MHz in the band 2390 – 2400 MHz, which is the case in Koreas for the WiBro system.

B.) LTE/WiMax interference case at the upper end of the 2.3GHz band with Bluetooth devices. Ericsson is of the view that further studies are needed, but early indications are that an additional filter of the order of 20-30 dB to protect RLAN is needed on the LTE/WiMAX BSs together with a guard band of 10 MHz in the band 2390 – 2400 MHz, which is the case in Koreas for the WiBro system.

C.) LTE/WiMax interference case at the lower end of the 2.3GHz band with any users of the spectrum below 2.3GHz. Again Ericsson is of the view that further studies are needed; the usage is not understood at this point in time; however, in Korea (WiBro) a guard band of 10 MHz is used in the range 2290 – 2300 MHz to protect the usage below 2300 MHz from both the BS and mobile station (MS) usage above 2300 MHz.

D.) Inter-operator interference cases in the band WiMAX and or LTE (also LTE-LTE and WiMAX to WiMAX). Ericsson is of the view that a guard band of 5 MHz and additional filters 45 – [55] dB is needed between operators, on both operators' base stations. Filters are needed to improve both reception and transmission, roughly 40 dB and 50 dB respectively, with a 5 MHz guard band.

Current users of the band

Ericsson acknowledges the current uses of the band;Rurtel and Dail TV. We would like to understand the current user's perspective on the band and whether these users would not be better accommodated in other bands that are potentially more suited to their needs. If this was the case it would mean that potentially greater economic use of the band could be achieved.

Harmonisation

Ericsson believes the band may have great economies of globally driven by the use of the band in China which is expected to materialise in the coming years. However currently it has limited roaming potential in Europe and in the context of Ireland the band would have a lot more economic value if it is harmonised across Europe. We would encourage ComReg's work on spectrum within Europe in the RSC and RSPG and would suggest that if not already doing so that ComReg might consider taking part in the work of the European Electronic Communications Committee (ECC) Project Team 1 **(**PT1**)** with regard to the use of the 2300-2400MHz band in Europe.

Q. 2. Which of the licence types outlined above, in your view are the most appropriate for the 2.3 GHz band: national, regional , local or closed user group? Please cite reasons for your answer.

National. Ericsson is of the view that national licenses give the best economic return and value to the country.

Q. 3. Do you believe there is a possibility for a combination of all or some of the above in the 2.3 GHz band and, if so, in what way? Please set out your suggested approach.

While it is possible Ericsson is of the view it is not practical or efficient in a mobile context due to difficulties with interference & syncronisation inherent with TDD. For example different uplink/downlink ratios would not be possible at the borders between operators.

Q. 4. If you believe that there should be a combination of licence types in this band, how much spectrum should be allocated to each of the licence types defined in Question 2? For example, if you recommend in response to Question 2 that spectrum should be released on a national and regional basis, how much spectrum should be allocated to each licence type? Please give reasons for your answer.

As per our response to question 2. Ericsson is of the view that national licenses give the best economic return and value to the country.

Q. 5. If you believe that licences in this band should be offered on a regional basis, on what basis should ComReg determine the regions, e.g. provinces, groups of counties? Please support your response as appropriate.

As per our response to question 2. Ericsson is of the view that national licenses give the best economic return and value to the country.

Q. 6. If you believe Local Area licences to be the superior choice, what geographic area should these licences incorporate and on what basis? (For example, FWALA licences incorporate service area 20km from defined centre point of licence). What conditions should ComReg implement to mitigate potential interference between users using the same spectrum in adjacent geographical areas?

As per our response to question 2. Ericsson is of the view that national licenses give the best economic return and value to the country.

Q. 7. In order to protect current users of the 2.3 GHz band, ComReg proposes that any potential licences offered in the range 2300 – 2330 MHz would be released on the basis of local area or closed user group licences only. Do you agree with this proposal? If not, please give reasons for your answer.

We do not have enough information to answer this question. We would like to understand the current user's perspective on the band and whether these users would not be better accommodated in other bands that are potentially more suited to their needs. If this was the case it would mean that potentially greater economic use of the band could be achieved.

Q. 8. Do you agree with ComReg's proposal that if this spectrum is offered on a national and/or regional basis, it should be by means of an auction or auctions? Do you agree with ComReg's proposal to release any spectrum for local area licensing under a beauty competition? Please supply reasons to support your response.

No View.

Q. 9. Do you agree with ComReg's proposal to use benchmarking to assist in setting a fair licence fee for the spectrum? Alternatively, do you believe there is an alternative, superior method of setting the fees? Please supply reasons to support your response.

No View.

Q. 10. Do you agree with ComReg's proposal to make licence duration of spectrum in the 2.3 GHz band between 10 - 15 years long? Please supply reasons to support your response.

Yes. A reasonable license period is required in order to be able to make a return on investment.

Q. 11. Do you agree with ComReg's proposal to limit the amount of spectrum available to any given operator to 30 MHz for a given area? Please supply reasons to support your response.

No probably not or at least it is too early to determine if this is an appropriate cap. It depend on a number of factors, such as demand and the most efficient use of the spectrum. Technologies such as LTE and WiMAX need increasingly higher channel bandwidths to deliver the much higher speed being demanded in the market it may be premature to impose a spectrum cap.

Q. 12. Do you agree with ComReg's proposal to attach utility conditions to any potential licences in this band? If not, why? Please provide reasons for your answers.

Yes. Some conditions on usage would seem to be appropriate. What level of conditions should be done in consultation with potential operators in the band.

Q. 13. In your view what would be the most appropriate channel spacing for the 2.3 GHz band? Please give detailed reasons for you answer.

Ericsson is of the view that the band will be a TDD band globally therefore channel spacing is largely irrelevant. If by this ComReg mean channel width then this would depend on demand and the most efficient use of the spectrum. LTE is most efficient with channel bandwidths of 20MHz or more. So allocations that are a multiple of 20MHz may be more appropriate depending on demand.

Q. 14. Do you support ComReg's proposed power limit? If not, please set out the reasons for your answer.

No.
Ericsson is of the view that there is no need to distinguish between home, car (mobile) or mobile CPE usage, the same terminal devices will likely be used in all cases with an RF power of 23 dBm eirp.

With regard to Fixed Link Stations ComReg suggests a maximum EIRP limited to 200 watts. This equates to approx. 53 dBm eirp assuming 38 dBm from transmitter (6,3 W) and a feeder loss of 3 dB and an antenna gain of 18 dBi. To make the operations economical viable in rural areas a higher maximum RF power is required, see the WAPECS decisions which is allowing for 61 dBm eirp and on national basis 68 dBm eirp.

Q. 15. Do you agree with ComReg's proposal to adapt the Block Edge Mask that applies to the 2500 – 2690 MHz band to the 2.3 GHz band, once a channel bandwidth has been agreed? Please provide reasons to support your response.

Yes between operators.

Q. 16. Do you agree with ComReg's proposal to impose the unwanted emission limits detailed above? Please provide reasons to support your response.

In general yes, however we belive no distinction should be made between fixed or mobile usages. Also, Ericsson is of the view that perhaps aligning with the WAPECS decision (-45 dBm/1 MHz) may be more appropriate.

6 HeaNET, including letters of approval from Institue of Technology Ireland (IOTI) and Irish Universities Association (IUA)

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HEAnet responses to Comreg-09-49

Q. 1. ComReg proposes to release spectrum for licensing additional services in the 2.3 GHz band. Do you support ComReg's proposal to release spectrum in the band? Are there other issues, besides those identified above, which ComReg needs to take into account in releasing spectrum in the band? Please give reasons for your answer. 11

Yes, HEAnet supports ComReg's proposal to release spectrum in the 2.3Ghz band.

Q. 2. Which of the licence types outlined above, in your view are the most appropriate for the 2.3 GHz band: national, regional , local or closed user group? Please cite reasons for your answer. 14

HEAnet supports, national, local and closed user group types of licenses in the 2.3Ghz band. A national license would enable a commercial operator to provide a national service which has many benefits for the consumer, along with the possibility of introducing additional competition between different technology platforms.

The difference between regional and local licenses becomes blurred at 2.3Ghz due to the better propagation characteristics of 2.3Ghz in comparison to 3.5Ghz, for example. HEAnet would like to see smaller distance boundaries being applied to local licenses rather than 20Km radius circles. Alternative solutions such as using smaller sectors and lower power should be considered as an alternative to indiscriminate boundaries.

HEAnet is in favour of allocating spectrum on a local basis to closed user groups in the 2.3 to 2.33Ghz region. This would allow HEAnet, together with the local computer service departments, to provide broadband access services to staff and students on and near Higher Education Institutions and Schools nationally. Solutions to closed user group licenses working within 2300-2330 Mhz would need to be investigated but we are of the opinion that this could easily be facilitated in Rurtel areas.

Q. 3. Do you believe there is a possibility for a combination of all or some of the above in the 2.3 GHz band and, if so, in what way? Please set out your suggested approach.
..... 14

Yes, we believe that the commission should consider allowing local, national, and closed user group licenses with the 2300 -2400 Mhz band.

HEAnet supports the allocation of the band into one 40 Mhz National license and 30 Mhz shared between Local licenses.

The 30 Mhz between 2.3 and 2.33 Ghz should be allocated to closed user groups on a non-interference basis.

Q. 4. If you believe that there should be a combination of licence types in this band, how much spectrum should be allocated to each of the licence types defined in Question 2? For example, if you recommend in response to Question 2 that spectrum should be released on a national and regional basis, how much spectrum should be allocated to each licence type? Please give reasons for your answer.
..... 14

National Licence – 1 x 40 Mhz

Local License – 1 x 30 Mhz. This 30 Mhz should be made available on a case by case basis to ensure that the spectrum can be utilised fairly among local providers.

Closed user group – 1 x 30 Mhz on a non-interference basis. Or possibly 2 x 15 Mhz in areas where competition for a license exists.

Q. 5. If you believe that licences in this band should be offered on a regional basis, on what basis should ComReg determine the regions, e.g. provinces, groups of counties? Please support your response as appropriate. 14

Commercial operators do not design their networks based on geography but on demand for their services. Hence trying to second-guess which geographical areas are appropriate for a regional license could lead to sub-optimal use of spectrum. Operators can easily apply for several local licenses to cover their customer locations rather than a specific geographic location.

Q. 6. If you believe Local Area licences to be the superior choice, what geographic area should these licences incorporate and on what basis? (For example, FWALA licences incorporate service area 20km from defined centre point of licence). What conditions should ComReg implement to mitigate potential interference between users using the same spectrum in adjacent geographical areas? 14

HEAnet believes that there is a requirement for local licences but the 20Km radius used for FWALA is too high. Limiting power and distance to a 5Km radius could prove more useful for local licenses. Additionally, using circles as boundaries assumes the use of omni-directional antennae which may not be the best mechanism for ensuring non-interference. Direction of antennae should also be taken into consideration.

Q. 7. In order to protect current users of the 2.3 GHz band, ComReg proposes that any potential licences offered in the range 2300 – 2330 MHz would be released on the basis of local area or closed user group licences only. Do you agree with this proposal? If not, please give reasons for your answer. 14

HEAnet agrees with this proposal. The band 2300 – 2330 Mhz should be limited to local and closed user group licenses only. Additionally, licenses should be made available for closed user group and local groups on a non-interference basis in areas where Rurtel operates. Rurtel is a point-to-point and point-to-multipoint service which has very low numbers of users. Implementing exclusions zones based on circles emanating from a base station is a less than optimal use of spectrum. HEAnet believes that by limiting power and with the correct use of antennas we could provide a service to our community in areas where Rurtel operates on a non-interference/secondary basis.

As one third of the HEAnet community are based in the Dublin area, access to spectrum in Dublin in 2300-2400 Mhz is also required. However, Dail TV operates in the middle of 2300-2330 Mhz using a digital broadcast TV type service to a small number of users. Optimally, these customers of Aervision couild be migrated to the free Dail TV service, which is streamed over the Internet by HEAnet. HEAnet is willing to work with Aervision/Airpseed on possible solutions. Perhaps ComReg could also help in encouraging Aervision to either move to alternative spectrum or to the free Internet service. Alternatively, HEAnet would have to consider local licenses in 2330-2400Mhz.

Q. 8. Do you agree with ComReg's proposal that if this spectrum is offered on a national and/or regional basis, it should be by means of an auction or auctions? Do you agree with ComReg's proposal to release any spectrum for local area licensing under a beauty competition? Please supply reasons to support your response. 15

Nationally - No opinion.

Local/Closed user groups. HEAnet is a not-for-profit organisation with a closed customer base and hence any competition based on a commercial evaluation would put HEAnet at a serious disadvantage. Therefore, our preference would be that any evaluation process would consider also the social and educational benefits of a request from HEAnet for a closed user license rather than on any commercial aspects. If the Commission chooses not to allow closed user group licenses in areas such as Rurtel and DailTV, HEAnet may have to consider local licenses. If this did happen, once again we would strongly anticipate that HEAnet would not be penalised in any evaluation process on the basis of not offering a commercial service.

Q. 9. Do you agree with ComReg's proposal to use benchmarking to assist in setting a fair licence fee for the spectrum? Alternatively, do you believe there is an alternative, superior method of setting the fees? Please supply reasons to support your response.
..... 16

No opinion.

Q. 10. Do you agree with ComReg's proposal to make licence duration of spectrum in the 2.3 GHz band between 10 - 15 years long? Please supply reasons to support your response.
..... 16

Yes, HEAnet believes that a national license for 10-15 years is reasonable. For regional, local and closed user groups shorter terms should be considered.

Q. 11. Do you agree with ComReg's proposal to limit the amount of spectrum available to any given operator to 30 MHz for a given area? Please supply reasons to support your response.
..... 18

No opinion.

Q. 12. Do you agree with ComReg's proposal to attach utility conditions to any potential licences in this band? If not, why? Please provide reasons for your answers.
..... 18

Yes, HEAnet agrees with ComReg's proposal to attach a "use it or lose it" clause to any spectrum license.

Q. 13. In your view what would be the most appropriate channel spacing for the 2.3 GHz band? Please give detailed reasons for you answer. 19

5Mhz blocks appears to be the most acceptable to equipment and service providers. That said, operators should be left to decide the channel spacing themselves.

Q. 14. Do you support ComReg's proposed power limit? If not, please set out the reasons for your answer. 19

Yes, HEAnet agrees with the power limits for the use of this spectrum. Much lower limits could be adopted to ensure non-interference between operators for closed user groups and local licenses.

Q. 15. Do you agree with ComReg's proposal to adapt the Block Edge Mask that applies to the 2500 – 2690 MHz band to the 2.3 GHz band, once a channel bandwidth has been agreed? Please provide reasons to support your response. 20

Enforcing a BEM of a particular size removes any flexibility between operators of adjacent frequencies to come to a local agreement. Using a block edge mask of 5Mhz is acceptable to HEAnet but this value is considered to be on the large side; smaller BEMs should be allowed for smaller allocations of spectrum.

Q. 16. Do you agree with ComReg's proposal to impose the unwanted emission limits detailed above? Please provide reasons to support your response. 20

Yes, HEAnet agrees with ComReg's proposal on unwanted emissions.

Eoin Kenny

28th July 2009

UNIVERSITY of LIMERICK

OLLSCOIL LUIMNIGH

Ms. Sinead Devey
Commission for Communications Regulation
Irish Life Centre
Abbey Street Freepost
Dublin 1

Re: Release of Spectrum in the 2300 – 2400 MHz band (document number 09/49)

Dear Ms Devey

I write to you in response to the Commission's consultation paper, on behalf of the members of Irish Universities' Association.

The seven Irish Universities, through their Computer Centre Directors, have supported HEAnet's request for licensed radio spectrum suitable for use in wireless services for its Higher Education Institute members. We now welcome the proposals of the Commission on the licensing of the 2.3 - 2.4 Ghx band of radio spectrum. We support the option to consider closed user groups and are of the view that reservation of spectrum for the education and research sector would be an innovative step and one that would fulfil the Commission's remit in several ways.

The Universities have managed the access of wireless devices to their campus networks over the years. IT Departments have stimulated this uptake and have layered integrated e-learning and ancillary services over the extended wireless network, using wi-fi technology. Working with HEAnet, they have deployed eduroam as a service in support of Europe-wide student mobility. They also collaborate in the development of the National Digital Learning Repository, hosted by HEAnet and available across all higher education sectors.

By extension, the Universities see Wimax as a vital element in the next generation of mobility and ubiquitous access. It will rationalise and enhance services now delivered over large numbers of wifi nodes, often hundreds in a campus. It will extend the range and so provide service both on and near campus; this will have tangible benefits in the urban settings of our universities.

The demand for wireless service is demonstrable and significant. In our campus networks, we can identify thousands of unique mobile devices - mainly laptop computers – using services on a regular basis. Universities have various incentives, such as special discounts, free loans of laptops which have helped in the success of e-learning programmes. With over 100,000

students in the Universities, and with laptop ownership at saturation in many courses, the uptake of suitable licensed spectrum by the sector could be poised for take-off.

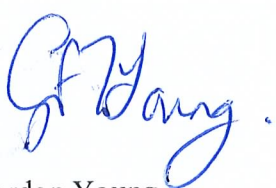
HEAnet's national mobile broad band scheme will be available for a second year from September, and this will continue to complement the investment in campus-based services.

We aim to work with HEAnet in the rollout of Wimax in the HEIs, with overall national objectives and standards of service. These would include support for eduroam and Edugain, service levels in keeping with the functional requirements of e-learning and research, and the mission-critical nature of IT services for academia.

We regard long-term access to the requisite licensed spectrum as key to our core business. As with the e-infrastructure for education and research provided by HEAnet's backbone network, so dedicated spectrum for our community is key to the national policy for learning and development. It will underpin the unique aspects of Campus Ireland and enable it to be a centre of excellence.

We fully support this initiative of reserved spectrum for strategic closed user groups, and see it as a requisite to implementing the national wireless strategy proposed by HEAnet.

Yours sincerely



Gordon Young
Director
IT Department, UL

IOTI
Institutes of Technology Ireland

Ms. Sinead Devey
Commission for Communications Regulation
Irish Life Centre
Abbey Street Freepost
Dublin 1

17th July 2009

Re: **Release of Spectrum in the 2300 – 2400 MHz band (document number 09/49)**

Dear Ms Devey

I refer to the Commission's consultation paper in the above.

IOTI, on behalf of its thirteen member Institutes of Technology, welcomes the proposals of the Commission on the licensing of the 2.3 - 2.4 Ghx band of radio spectrum. We support the option to consider closed user groups and are of the view that reservation of spectrum for the education and research sector would be an innovative step and one that would fulfil the Commission's remit in several ways.

In this sense, we support HEAnet's strategy of leveraging wireless technology to provide ubiquitous and mobile broadband. This complements investments made in IT services by the Institutes of Technology, and it will enable wider and further enhanced e-learning by the 50,000+ students in the Institutes.

The Institutes are also involved, in collaboration with industry, in developing standards and applications for wireless broadband. The Commission has been of great assistance to us in this regard, with advice and provision of pilot licenses. We look forward to the use of radio spectrum for innovative and sustained research and development purposes.

HEAnet is progressing its wireless strategy in several strands. This includes the procurement of mobile broadband at very favourable rates for students and staff, and the further rollout of eduroam as a service to provide mobile access while roaming at third level institutions in Ireland and throughout Europe. As members of HEAnet, the Institutes of Technology are at one with all other members in using wireless spectrum to complement the fixed IT infrastructure. Our national education and research network is in the top flight worldwide, and

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we support the option provided by the Commission and HEAnet's application to lead in the rollout of quality broadband access in, and near, campus.

Yours sincerely

Gerry Murray
CEO

7 Hutchison 3G Ireland Limited

Hutchison 3G Ireland Limited
3rd Floor,
6-10 Suffolk Street,
Dublin 2

Ms Sinead Devey
Commission for Communications Regulation
Irish Life Centre
Lower Abbey Street
Dublin 1
BY REGISTERED POST AND EMAIL: sinead.devey@comreg.ie

29 July 2009

Dear Sinead

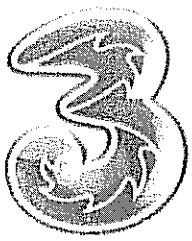
SUBMISSION RE COMREG 09/49

Please find enclosed our submission.

Yours sincerely

MARK HUGHES
Head of Regulatory

Encl.



Response by Hutchison 3G Ireland Limited
in respect of ComReg Doc. No. 09/49
"Release of Spectrum in the 2300 – 2400 MHz band"

29 July 2009

Q. 1. ComReg proposes to release spectrum for licensing additional services in the 2.3 GHz band. Do you support ComReg's proposal to release spectrum in the band? Are there other issues, besides those identified above, which ComReg needs to take into account in releasing spectrum in the band? Please give reasons for your answer.

H3GI supports ComReg's proposal to release spectrum in the band.

Q. 2. Which of the licence types outlined above, in your view are the most appropriate for the 2.3 GHz band: national, regional , local or closed user group? Please cite reasons for your answer.

For the purposes of economies of scale, ComReg should award national licences in respect of 2330 – 2400 MHz. It should issue local area and closed user group licences in respect of 2300 – 2330 MHz.

Q. 3. Do you believe there is a possibility for a combination of all or some of the above in the 2.3 GHz band and, if so, in what way? Please set out your suggested approach.

Please see the answer to question 2.

Q. 4. If you believe that there should be a combination of licence types in this band, how much spectrum should be allocated to each of the licence types defined in Question 2? For example, if you recommend in response to Question 2 that spectrum should be released on a national and regional basis, how much spectrum should be allocated to each licence type? Please give reasons for your answer.

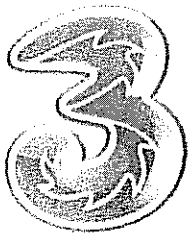
Please see the answer to question 2.

Q. 5. If you believe that licences in this band should be offered on a regional basis, on what basis should ComReg determine the regions, e.g. provinces, groups of counties? Please support your response as appropriate.

Not applicable.

Q. 6. If you believe Local Area licences to be the superior choice, what geographic area should these licences incorporate and on what basis? (For example, FWALA licences incorporate service area 20km from defined centre point of licence). What conditions should ComReg implement to mitigate potential interference between users using the same spectrum in adjacent geographical areas?

ComReg should mirror the approach that it takes in respect of FWALA.



Q. 7. In order to protect current users of the 2.3 GHz band, ComReg proposes that any potential licences offered in the range 2300 – 2330 MHz would be released on the basis of local area or closed user group licences only. Do you agree with this proposal? If not, please give reasons for your answer.

H3GI agrees with this proposal.

Q. 8. Do you agree with ComReg's proposal that if this spectrum is offered on a national and/or regional basis, it should be by means of an auction or auctions? Do you agree with ComReg's proposal to release any spectrum for local area licensing under a beauty competition? Please supply reasons to support your response.

H3GI agrees with ComReg's proposals. In relation to the award of local area licensing, H3GI would appreciate if ComReg could explain how it will award a licence for equally valid competing applications for different uses.

Q. 9. Do you agree with ComReg's proposal to use benchmarking to assist in setting a fair licence fee for the spectrum? Alternatively, do you believe there is an alternative, superior method of setting the fees? Please supply reasons to support your response.

H3GI agrees with ComReg's proposal to use benchmarking to assist in setting a fair licence fee for the spectrum.

Q. 10. Do you agree with ComReg's proposal to make licence duration of spectrum in the 2.3 GHz band between 10 - 15 years long? Please supply reasons to support your response.

H3GI agrees with ComReg's proposal to make licence duration of spectrum in the 2.3 GHz band between 10 – 15 years long.

Q. 11. Do you agree with ComReg's proposal to limit the amount of spectrum available to any given operator to 30 MHz for a given area? Please supply reasons to support your response.

H3GI agrees with ComReg's proposal to limit the amount of spectrum available to any given operator to 30 MHz for a given area.

Q. 12. Do you agree with ComReg's proposal to attach utility conditions to any potential licences in this band? If not, why? Please provide reasons for your answers.

Subject to the following comments, H3GI agrees with ComReg's proposal to attach utility conditions to any potential licences in this band:

1. Given the uncertain and ancillary nature of this spectrum, ComReg should not prescribe rollout and coverage obligations in respect of any national licences. Instead, it should oblige licensees to demonstrate that they are using these

licences or have reasonable plans to use these licences in the short to medium term.

2. ComReg does not have the power to reduce the area in which a licensee can provide services.

Q. 13. In your view what would be the most appropriate channel spacing for the 2.3 GHz band? Please give detailed reasons for you answer.

5 MHz. 5 MHz is the smallest block usable for 3G, HSPA and LTE services.

Q. 14. Do you support ComReg's proposed power limit? If not, please set out the reasons for your answer.

H3GI supports ComReg's proposed power limit.

Q. 15. Do you agree with ComReg's proposal to adapt the Block Edge Mask that applies to the 2500 – 2690 MHz band to the 2.3 GHz band, once a channel bandwidth has been agreed? Please provide reasons to support your response.

H3GI agrees with ComReg's proposal.

Q. 16. Do you agree with ComReg's proposal to impose the unwanted emission limits detailed above? Please provide reasons to support your response.

H3GI agrees with ComReg's proposal.

8 Imagine Communications group

Release of Spectrum in the 2300 – 2400MHz band

Imagine Communications Group Response to the Consultation

1. Introduction

Imagine welcomes the opportunity to respond to this consultation. The release of additional spectrum in the 2300-2400 MHz band is to be welcomed and will help to further strengthen the provision of wireless broadband services in Ireland.

2. Response to Consultation

Q.1. ComReg proposes to release spectrum for licensing additional services in the 2.3 GHz band. Do you support ComReg's proposal to release spectrum in the band? Are there other issues, besides those identified above, which ComReg needs to take into account in releasing spectrum in the band? Please give reasons for your answer.

Imagine supports this proposal from ComReg to release spectrum in the 2.3-2.4GHz band. This band is allocated by the ITU as an IMT band (WRC-07) and as such it is standardised across international markets for mobile broadband services. This means that there is a credible long-term roadmap for service deployment in this band using IMT technologies.

In particular, WiMAX already has a strong foothold in this band with a large number of international deployments in progress. The WiMAX Forum has commenced validation testing in this band and it is anticipated that the first WiMAX Forum certified products will be ready by Q4 2009. To-day the band is used in 29 commercial WiMAX deployments worldwide in countries such as Malaysia, Indonesia, Singapore, and Georgia. Certification of 2.3GHz devices will pave the way for WiMAX Forum Certified tri-band devices and global roaming across networks in the 2.3, 2.5, and 3.5GHz spectrum bands from 2010.

Q.2 Which of the licence types outlined above, in your view are the most appropriate for the 2.3 GHz band: national, regional, local or closed user group? Please cite reasons for your answer.

Imagine supports the combination of regional and local licences for the 2.3GHZ band.

Regional licences should be used for the 2330-2400MHz band. This approach offers the benefits of allowing operators to roll-out services in areas of interest to them without the expenditure of committing to a national roll-out. Given the increased constraints on capital this is more likely to result in meaningful regional deployments than a national licence.

Local Area licences should be used for the 2000-2300MHz band. This should build on the success of the FWALA scheme which has resulted in significant successful broadband wireless deployments throughout the country. This additional spectrum would allow the continuation of this success into this standard band.

Imagine does not believe that spectrum should be reserved for closed user groups for a number of reasons:

- The demand for mobile broadband services is increasing rapidly and therefore reserving IMT spectrum including the 2.3GHz band for closed user groups would be short-sighted. In the year to 2009, mobile broadband subscribers worldwide grew by 93% year on year to more than 225 million subscribers (source: Informa Telecoms and

Media World Cellular Data Metrics Report, July 2009). In addition, the use of mobile broadband services is increasing with Allot Communications reporting annual traffic growth in excess of 100% per year with http video streaming the fastest growing application. Therefore, IMT spectrum should be reserved for commercial application to ensure that Ireland can meet the increasing demands from users on mobile broadband networks.

- The allocation of this spectrum for closed user groups will result in an inefficient use of spectrum, as it will prevent the use of this spectrum for community-wide services in these locations.

- The exclusion zones to prevent interference will by necessity extend beyond the borders of the individual campus. This will result in a highly inefficient geographic availability of the spectrum.

- There is ample licence-exempt spectrum in Ireland for closed user group applications. This includes the 2.4GHz ISM band as well as >200MHz of spectrum in 5.4GHz and 5.8GHz licence-exempt bands.

- The closed user groups of the type envisaged are well provided for by commercial telecommunications operators both in terms of fixed and mobile telecommunications services. By releasing spectrum to commercial operators these closed user groups as well as the whole community will ultimately benefit through enhanced cross-platform competition thus removing the requirement for such groups to provide these services themselves.

Q. 3. Do you believe there is a possibility for a combination of all or some of the above in the 2.3 GHz band and, if so, in what way? Please set out your suggested approach.

Yes. A combination of regional and local area licences should be used as set-out above.

Q. 4. If you believe that there should be a combination of licence types in this band, how much spectrum should be allocated to each of the licence types defined in Question 2? For example, if you recommend in response to Question 2 that spectrum should be released on a national and regional basis, how much spectrum should be allocated to each licence type? Please give reasons for your answer.

Given existing usage of the band, the spectrum split proposed by ComReg is logical. On this basis, 30MHz from 2330-2330MHz should be used for local area licences and 70MHz from 2330-2400MHz should be used for regional licences.

Q. 5. If you believe that licences in this band should be offered on a regional basis, on what basis should ComReg determine the regions, e.g. provinces, groups of counties? Please support your response as appropriate.

Imagine would suggest a maximum of 4 regions on a provincial basis. Consideration should be given to combining Connaught and Ulster into a single licence area to ensure adequate population coverage to justify deployment in this region.

Q. 6. If you believe Local Area licences to be the superior choice, what geographic area should these licences incorporate and on what basis? (For example, FWALA licences incorporate service area 20km from defined centre point of licence). What conditions should ComReg implement to mitigate potential interference between users using the same spectrum in adjacent geographical areas?

The existing FWALA framework should apply. However some adjustment may be required on the basis of technical evaluation to account for propagation differences in this band compared to 3.4-3.8GHz. This would require further investigation.

Q. 7. In order to protect current users of the 2.3 GHz band, ComReg proposes that any potential licences offered in the range 2300 – 2330 MHz would be released on the basis of local area or closed user group licences only. Do you agree with this proposal? If not, please give reasons for your answer.

Imagine agrees with the release of this spectrum for local area licences on the basis that it will minimise the potential for delay in releasing this spectrum to the market.

Q. 8. Do you agree with ComReg's proposal that if this spectrum is offered on a national and/or regional basis, it should be by means of an auction or auctions? Do you agree with ComReg's proposal to release any spectrum for local area licensing under a beauty competition? Please supply reasons to support your response.

Imagine does not agree that an auction mechanism should be used to award this spectrum. Rather the award process should be designed to ensure that the spectrum is awarded to bidders that will bring enhanced competition and value to the market.

Should an auction be used, use it or lose it clauses should be applied to ensure that the spectrum is not hoarded and is used to provide meaningful services to end users.

Q. 9. Do you agree with ComReg's proposal to use benchmarking to assist in setting a fair licence fee for the spectrum? Alternatively, do you believe there is an alternative, superior method of setting the fees? Please supply reasons to support your response.

Benchmarking may be used as one input to assist in setting the licence fee. However, the benefits of spectrum liberalisation are not achieved by the amount someone is prepared to pay to acquire spectrum. Part of the award process should test the intent of any alternative bidders to bring competition and increased value to the market. The price of the spectrum and ongoing fees should take this into account. The price of any spectrum block should also reflect the high cost of deploying network in Ireland and the low

population densities in many locations. These factors would necessitate a reduced fee compared to international benchmarks.

Q. 10. Do you agree with ComReg's proposal to make licence duration of spectrum in the 2.3 GHz band between 10 - 15 years long? Please supply reasons to support your response.

Licences should be awarded for a minimum period of fifteen years to provide sufficient time for adequate capital return.

Q. 11. Do you agree with ComReg's proposal to limit the amount of spectrum available to any given operator to 30 MHz for a given area? Please supply reasons to support your response.

Imagine agrees with this proposal . This option maximises the potential for new entrants to enter the market thereby ensuring that competition is promoted by this spectrum award.

Q. 12. Do you agree with ComReg's proposal to attach utility conditions to any potential licences in this band? If not, why? Please provide reasons for your answers.

Imagine agrees with this proposal. This will ensure that greater competition is facilitated through the deployment of services to end users thus facilitating the wider public good. Without utility conditions it is possible that spectrum will be hoarded to restrict the deployment of new competitive services in the market.

Q. 13. In your view what would be the most appropriate channel spacing for the 2.3 GHz band? Please give detailed reasons for you answer.

WiMAX rev e channel profiles are 5MHz, 8.75MHz, 10MHz, and 20MHz. Of these, the 10MHz and 20MHz profiles are supported by Intel WiMAX chipsets for CPE and laptops. Therefore our preference is for a 10MHz channel spacing as the most appropriate to ensure maximum compatibility both with base station equipment and with end-user devices.

Q. 14. Do you support ComReg's proposed power limit? If not, please set out the reasons for your answer.

The power limits should be set in accordance with the relevant ETSI specifications and should be compliant with WiMAX Forum recommendations.

Q. 15. Do you agree with ComReg's proposal to adapt the Block Edge Mask that applies to the 2500 – 2690 MHz band to the 2.3 GHz band, once a channel bandwidth has been agreed? Please provide reasons to support your response.

Imagine is in agreement with this approach. The block edge mask should be subsequently reviewed to ensure it is compliant with the relevant ETSI specifications.

Q. 16. Do you agree with ComReg's proposal to impose the unwanted emission limits detailed above? Please provide reasons to support your response.

Imagine is in agreement with this proposal. Any unwanted emissions from users of the 2.3GHz band should be provided on a reciprocal basis with those users adjacent to the 2.3GHz band.

9 Intel Corporation (UK) Ltd

To:

Commission for
Communications Regulation

Peter Gibson
Intel Corporation
EMEA Communications Team
Global Public Policy

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Date: 28th July 2009

Release of Spectrum in the 2300 – 2400 MHz band.

Proposed Options & License Conditions

To: Ms. Sinead Devey
Commission for Communications Regulation
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Name of respondent: Peter Gibson
Wireless Standards and Regulations Manager
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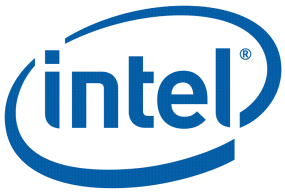
Representing: Intel Corporation (UK) Ltd

Address: Pipers Way, Swindon, Wilts, SN3 1RJ, United Kingdom

Date: Tuesday, 28 July 2009

Intel welcomes the opportunity to provide our views on the ComReg proposals for the release of the 2300 – 2400 MHz (2.3 GHz) band. This document sets out Intel's response to the specific areas of interest and expertise. Intel supports the overall position of ComReg with regards to technology and service neutrality and believes that operators are best able to determine which technology is most suitable for their business model.



Q. 1. ComReg proposes to release spectrum for licensing additional services in the 2.3 GHz band. Do you support ComReg's proposal to release spectrum in the band? Are there other issues, besides those identified above, which ComReg needs to take into account in releasing spectrum in the band? Please give reasons for your answer.

Intel Response to Question 1.

Intel fully supports ComReg's proposal to release the majority of the 2.3 GHz band for the licensing of additional services. The 2.3 GHz band has been released in many other parts of the world for BWA type services and Intel expects similar services to be enabled in Ireland using the 2.3 GHz band. Intel recognises that the band is not harmonised or likely to be harmonised across Europe as BWA. However Intel is aware of other Countries within Europe who have/are expressing an interest in making the band or parts of the band available for BWA services. The application of TDD technology makes it well suited for partial release of the band provided there is a minimum of 30 MHz contiguous spectrum per licence.

The 2.3 GHz band is an important band for mobile broadband wireless access services and compliments the 2.6 GHz band which is available globally for similar services. There are profiles developed within the WiMAX Forum for the 2.3 GHz band which will enable interoperability through the WiMAX Forum certification process. Multiband solutions covering the 2.3 and 2.6 GHz bands (inc WiFi) are developed and embedded silicon solutions currently enables 100s of devices from multiple vendors to seamlessly connect to WiMAX services across the world. Ireland and its consumers will benefit through availability of the 2.3 GHz band and the WiMAX eco-system providing integrated solutions.

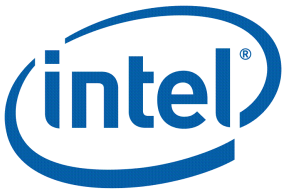
The timing of the availability of spectrum is crucial to maximise the benefit for the Irish consumer as an integral part of the continued success of WiMAX and therefore Intel urges ComReg to make provision for the expeditious release of the spectrum. A time frame of no later than end of 2009 would be our suggestion.

Q. 2. Which of the licence types outlined above, in your view are the most appropriate for the 2.3 GHz band: national, regional , local or closed user group? Please cite reasons for your answer.

Intel Response to Question 2.

Intel supports National licensing as this limits adjacent region interference, avoids the need for detailed in-country coordination, and reduces guard band/restricted channel requirements between operators thus maximising spectrum efficiency. If regional licenses are to be considered then the number of regions should be minimised to reduce the coordination activities.

Noting that ComReg are suggesting a combination of licence awards we would urge that the National licence(s) are provided starting at 2330 MHz, and believes the entire band should eventually be made available (see answer to Question 7) In other parts of the world where they have introduced regional licensing this tends to be at the top end of the band. In addition an allocation at 2330 MHz would provide greater future options for a national operator should additional spectrum be required or be made available.



Q. 3. Do you believe there is a possibility for a combination of all or some of the above in the 2.3 GHz band and, if so, in what way? Please set out your suggested approach.

Intel Response to Question 3.

Intel believes that National licensing should take precedence for the reasons given to our response in Question 2.

Q. 4. If you believe that there should be a combination of licence types in this band, how much spectrum should be allocated to each of the licence types defined in Question 2? For example, if you recommend in response to Question 2 that spectrum should be released on a national and regional basis, how much spectrum should be allocated to each licence type? Please give reasons for your answer.

Intel Response to Question 4.

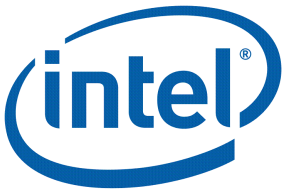
Intel believes the spectrum should be allocated for National licensing. Intel advocates that the spectrum is awarded via auction in blocks of 5 MHz. Intel suggests that a minimum of 30 MHz is necessary to support the range of services envisaged and that 60 MHz may eventually be required to satisfy future demand. Depending on the auction design the spectrum could be offered in blocks of 5 MHz and aggregated accordingly.

If the auction design is to be kept simple in design then noting that there is 70 MHz being made available then Intel would suggest, in this instance, that 2 licences of 35 MHz each could be considered. Two 35 MHz blocks would provide licensees with flexibility to choose between different channel widths or use a combination of channel widths, and also provides flexibility in placement of RF carrier inside their block to avoid interference.

Q. 5. If you believe that licences in this band should be offered on a regional basis, on what basis should ComReg determine the regions, e.g. provinces, groups of counties? Please support your response as appropriate.

Intel Response to Question 5.

Intel offers no specific comment on regional licensing which we don't believe should be implemented.



Q. 6. If you believe Local Area licences to be the superior choice, what geographic area should these licences incorporate and on what basis? (For example, FWALA licences incorporate service area 20km from defined centre point of licence). What conditions should ComReg implement to mitigate potential interference between users using the same spectrum in adjacent geographical areas?

Intel Response to Question 6.

Intel offers no specific comment on local area licensing which we don't believe should be implemented.

Q. 7. In order to protect current users of the 2.3 GHz band, ComReg proposes that any potential licences offered in the range 2300 – 2330 MHz would be released on the basis of local area or closed user group licences only. Do you agree with this proposal? If not, please give reasons for your answer.

Intel Response to Question 7.

Intel notes the use by Rurtel of 2 x 20 MHz of spectrum (2307 – 2327 MHz paired with 2407 – 2427 MHz) to provide wireless telephony services to customers in rural areas of the country. Such services are obviously now much more efficiently provided as applications over broadband access using licenced spectrum. Accordingly the continued use of the band 2300-2330 MHz for these services would stand in stark contrast to the rest of the 2300 MHz band which will be providing far greater and more economical wireless services.

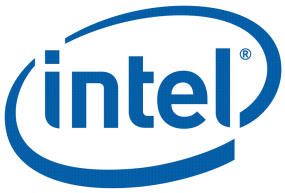
The use of a non-market means to introduce into the unused portion of the 2300-2330 MHz band other users, would only serve to lock in its current inefficient use, and deny potential benefits to all Irish consumers.

Accordingly Intel urges ComReg to explore means of re-farming the current use of this spectrum for its eventual use in a more flexible approach, and any initial award of unused spectrum in the 2300-2330 MHz band be carried out on a market based and flexible basis.

Q. 8. Do you agree with ComReg's proposal that if this spectrum is offered on a national and/or regional basis, it should be by means of an auction or auctions? Do you agree with ComReg's proposal to release any spectrum for local area licensing under a beauty competition? Please supply reasons to support your response.

Intel Response to Question 8.

Intel believes that a market driven approach provides substantial benefits to consumers and businesses. Intel supports an auction process facilitating a market-based mechanism for the award. Auctions offer the best opportunity for an open and transparent award process.



Q. 9. Do you agree with ComReg's proposal to use benchmarking to assist in setting a fair licence fee for the spectrum? Alternatively, do you believe there is an alternative, superior method of setting the fees? Please supply reasons to support your response.

Intel Response to Question 9.

Intel supports an auction for the awarding of spectrum and also on a National basis, therefore Intel would not advocate a licence fee to be paid in addition to the auction fee. This is not an award process that is commonly used by other Administrations and Intel would be concerned that additional fees would unnecessarily burden the operator. Fees have the added liability of creating uncertainty and can be particularly burdensome if increased later.

The development of a network should be the primary objective for both the operator and regulator to enable the successful deployment of mobile broadband services for the benefit of the Irish citizen.

Q. 10. Do you agree with ComReg's proposal to make licence duration of spectrum in the 2.3 GHz band between 10 - 15 years long? Please supply reasons to support your response.

Intel Response to Question 10.

Intel suggests that the licence duration should be 20 years with a legitimate expectation of renewal to provide operators with incentives to make and maintain long term network investments.

Q. 11. Do you agree with ComReg's proposal to limit the amount of spectrum available to any given operator to 30 MHz for a given area? Please supply reasons to support your response.

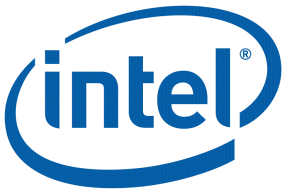
Intel Response to Question 11.

Intel's response to question 4 provides our view of how the spectrum should be allocated through the appropriate auction design.

Q. 12. Do you agree with ComReg's proposal to attach utility conditions to any potential licences in this band? If not, why? Please provide reasons for your answers.

Intel Response to Question 12.

Intel offers no specific views on utility conditions.



Q. 13. In your view what would be the most appropriate channel spacing for the 2.3 GHz band? Please give detailed reasons for you answer.

Intel Response to Question 13.

Intel recommends a channel spacing of 5 MHz which can be aggregated to enable 10 and 20 MHz bandwidth solutions which are envisaged for mobile broadband applications.

Q. 14. Do you support ComReg's proposed power limit? If not, please set out the reasons for your answer.

Intel Response to Question 14.

The proposed power limits are not necessarily aligned with other similar frequency bands. Specifically the limits mandated by the EC Decision 2008/477/EC for the 2.6 GHz band would be more appropriate for mobile application in the 2.3 GHz band. Intel would therefore request that ComReg considers mandating similar limits proposed in EC Decision 2008/477/EC.

Q. 15. Do you agree with ComReg's proposal to adapt the Block Edge Mask that applies to the 2500 – 2690 MHz band to the 2.3 GHz band, once a channel bandwidth has been agreed? Please provide reasons to support your response.

Intel Response to Question 15.

Intel agrees with the ComReg proposal to adopt the BEM developed for the 2.6 GHz band. We would suggest that operator synchronisation should be encouraged but not mandated. Synchronisation as studies have shown would enable the use of the spectrum block at the adjacency between licensees. In the absence of synchronisation then the implementation of the BEM will reduce potential interference to acceptable levels.

Intel notes that no technical details have been provided for the Rurtel service. In order to assess the potential impact for the incoming adjacent service we would welcome the opportunity to better understand the technical parameters of the Rurtel service.

Q. 16. Do you agree with ComReg's proposal to impose the unwanted emission limits detailed above? Please provide reasons to support your response.

Intel Response to Question 15.

Yes these are fully aligned with ITU and CEPT recommendations for mobile services.

10 Irish Amateur Television Club

Irish Amateur Television Club
C/o Ronnie McGrane EI9ED
Cavan Road
Kells
Co Meath

27 July 2009

In response to your Consultation Document 09/49.

In our case we would be happy to have the allocation on a secondary base 2300-2400 mhz.

We would see the ATV section in ATV repeater mode RX on 2335.0 and TX on 2385mhz.

This in our case would be the starts of the ATV band for us taking into account the Dail TV System.

Until now there was no activity on this band because no ATV licenses were allocated. We do not expect high usage due to the local area coverage.

The IARU allocation for ATV outputs was on 2.4 gigs. but because of the high broadband activity in this area it would be impossible to operate there.

Yours faithfully,

Ronald McGrane EI9ED
Chairman
Irish Amateur Television Club

11 Irish Radio transmitters Society

Irish Radio Transmitters Society
Established in 1932
amateur radio in ireland

Response to the Consultation Paper on the 2.3 to 2.4 GHz Band Document 09/49

published by

The Commission for Communications Regulation

from the

Irish Radio Transmitters Society (IRTS)

July 2009

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ComReg Consultation Paper on the 2.3 to 2.4 GHz Band Document 09/49

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11.2 ***PART 1***

11.3 1. Introduction

The Irish Radio Transmitters Society (IRTS) welcomes the opportunity provided by the Commission for Communications Regulation to comment on the recently published Consultation Paper on the 2.3 to 2.4 GHz band, Document 09/49. Part 1 of this response is an introductory section whilst Part 2 deals with the various issues within the Consultation Paper

The IRTS was founded in 1932. It is a non profit organisation and is the national society that represents licensed amateur radio operators in Ireland in respect of governmental and public relation matters. The IRTS is an active member of the International Amateur Radio Union (IARU), which is a sector member of the Radiocommunication (R) and Telecommunication Development (D) sectors of the International Telecommunication Union (ITU). The IARU also has observer status in the regional telecommunication organisation for Europe, the European Conference of Postal and Telecommunications administrations (CEPT), which addresses technical telecommunications regulatory matters, often under mandate from the European Commission.

11.4 2. Amateur Service

Amateur radio internationally is part of the leisure category or radiocommunications applications but has the distinction of being defined as a radiocommunications service in the ITU Radio Regulations[1], an international treaty instrument. In Article 5 of the Radio Regulations a number of frequency bands have been allocated to the amateur service and amateur-satellite service throughout the radio frequency spectrum.

Article 1.56 of the Radio Regulations describes the Amateur Service as," a radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest."

It is primarily a hobby in which participants use various types of radio communications equipment to communicate with other radio amateurs for public service, recreation, experimentation and self-training. The term ‘amateur’ is not a reflection on the skills of the participants, which are often addressing state of the art

[1] Radio Regulations of the International Telecommunication Union, Geneva.

techniques in radiocommunications; rather, the term 'amateur' indicates that amateur radio communications are not primarily involved in any commercial activities.

In Ireland, prior to 1 June 2009, amateur radio was encompassed by the term *Experimenter*. Under the Wireless Telegraphy (Amateur Station Licence) Regulations 2009 a new system of amateur radio licensing was introduced. Under these regulations radio amateurs are individually licensed by the Commission for Communications Regulation (ComReg). Radio amateurs establish radio stations in order to conduct experiments and engage in self-training in the science and technique of radiocommunications. Amateur stations utilise but are not limited to frequency bands allocated in Ireland to the amateur service. Irish radio amateurs are therefore involved in the recreational, public service, experimental and self training aspects of the global amateur radio movement.

Amateur radio operators enjoy personal (and often worldwide) radio communications with each other and in many jurisdictions (including Ireland) are able to support their communities with emergency and disaster communications as appropriate, while increasing their personal knowledge of electronics and radio theory.

In furtherance of public service emergency activities a group of radio amateurs formed the Amateur Radio Emergency Network (AREN). This network operates under the umbrella of the IRTS and is essentially run by the AREN organisation in co-operation with ComReg. The Network was sanctioned following Ireland's adoption of Resolution 640 (1979) of the ITU Radio Regulations, which provides for the utilisation of amateur radio communications in emergency situations. Previously, Irish radio experimenters (now amateurs) were licensed to communicate only with other radio experimenters or amateurs nationally and internationally. ComReg, however, now extends the terms and conditions of experimenters'/amateur licences who are members of AREN to permit them to pass messages on behalf of a range of designated emergency services. It is worth mentioning that the contribution of amateur radio operators to providing communications in times of emergency or natural disasters throughout the world is well recognised and documented.

A side benefit of amateur and experimental radio is the fostering of an interest in ICT subjects in children and young people, which in many instances will stimulate an educational and career path for the person involved. This is turn may create a greater pool of professionally qualified persons, which is available for employment in the Irish ICT sector.

There are approximately three million amateur stations in the world, a number that is increasing at the rate of 7% annually. The number and variety of modes of emission used by radio amateurs are also expanding, creating internal pressures within the amateur service for their accommodation at the expense of users of established modes such as single-sideband telephony and manual Morse code telegraphy operations. These new modes include digital voice, data and image. Their use improves the efficiency of amateur operations, but also increases the popularity of amateur radio and therefore the amount of frequency congestion.

In addition amateur radio operators continue to investigate propagation effects and are contributing to a greater understanding of how radio waves propagate for small percentages of time. Such scientific and investigative work requires frequency allocations in key parts of the spectrum and an extensive beacon network in order to conduct measurements over long periods of time.

PART 2

1. Background

The band 2.3 to 2.4 GHz is allocated to the fixed and mobile services on a primary basis and to the amateur and radiolocation service on a secondary basis.

In Ireland the use to date by the primary service has been limited. The current Radio Frequency Plan for Ireland lists the primary service uses as the RURTEL system and Dail TV.

In Europe the use of the band 2.3 to 2.4 GHz by commercial entities is limited due to other agreements, which make it available for military purposes. The table of frequency allocations for our nearest neighbour illustrates this with the UK table of frequency allocations (2008) dividing the band 2.3 to 2.4GHz into three separate sub-bands 2300 to 2302 MHz, 2302 to 2310 MHz and 2310 to 2450 MHz. It indicates that in the latter band 2310 to 2450 MHz, the allocation is reserved for Military use except by special agreement (Footnote UK2). Other footnotes (UK5, and UK 27) permitted access to the band by other services, such as programme making and special events on certain frequencies, along with the amateur service. This position was also reflected in the 2008 UK MOD consultation on defence spectrum use.

The band was first allocated to the Amateur Service back in 1947 on an exclusive basis. Over the years changes at various ITU conferences (Geneva 1959, Geneva1979 and Torremolinos 1992) have seen the number of services allocated to the band increase and the amateur allocation changed from primary to secondary. However these changes did not impact significantly on the amateur allocation due to the nature of use by the services with a primary allocation (limited geographic use or limited time use). Consequently it has been feasible for the amateur service, operating on a secondary basis, to co-exist with the primary services (Fixed & Mobile).

2. Developments

However the change made at WRC-07, which by footnote gives the mobile allocation an IMT designation, and upon which we understand this consultation is based, is of significant concern to the amateur community.

3. Discussion

A change in use by the services with a primary allocation (Mobile/Fixed) from one of a specialist nature, where the deployment may be limited in either location or time or both, to one involving the provision of consumer based services operating on a 24/7 basis (e.g. Broadband), that the IMT designation would allow, have the ability to make the band unusable by services with a secondary allocation.

The consultation under current status and use of the band in Ireland (section 4) makes limited reference to the amateur service use of the band. However unlike other secondary uses, such as services ancillary to programming (SAP) and services ancillary to broadcasting (SAB), the consultation document makes no reference to how the use of the band by amateur service in the future will be addressed, if ComReg proceed with its proposal to allow consumer based services throughout the entire band. To date the use of the band by the amateur service has been compatible with that of the other current uses (RURTEL, Dáil TV and SAP/SAB).

The consultation identifies that ComReg will need to take SAP/SAB applications into consideration when deciding on the use of the band. Like the amateur service this is secondary use and some consideration should also be given to ongoing amateur use of the band.

To promote efficient and effective use of spectrum by the amateur service the International Amateur Union (IARU) has developed band plans for the various bands. Where relevant these band plans take account of international and European spectrum usage plans as developed in ITU, CEPT or the EU. We note the comments in the consultation document on the lack of CEPT and ITU channel plans for the band as well as the pending item for WRC-11 concerning spectrum for SAP/SAB. In this regard we are concerned that by moving ahead of any European agreed harmonisation, Ireland in the longer term could find that it could be counterproductive particularly if the entire band is made available for consumer based services, as this could limit the ability of ComReg to facilitate SAP/SAB type uses, which we previously indicated is more compatible with use by the amateur service that consumer based services would be. We note from the document that a similar situation now arises with the 2.6 GHz band as it is currently licensed in Ireland for MMDS and consequently not available for use by other electronic communication services, although that is, we understand, how the band has been harmonised in Europe for use by electronic communications services.

Within the IARU band plan the following are considered important segments:

- *The segment below 2,330MHz particularly:*
  - *2320.8 to 2320.9 MHz used for Propagation Beacons*
  - *CW and SSB segment 2320.0 to 2322.0 MHz especially where it is used for weak signal activity such as Moonbounce (E-M-E).*
  - *In countries where the segment 2320 to 2322 is not available, then other segments used for E-M-E which Irish amateurs would listen on include*

2304.0 to 2306.0 MHz (North America), 2324.0 MHz and 2300.0 to 2302.0 MHz.

- *The 2.3 GHz band is an important 'gateway' band for beginners to microwave operation due to the availability of commercial equipment that can be readily adapted for use on the band. The availability of excellent kits at reasonable prices is generating increased interest in experimentation on the band.*
- *The segment 2390.0 to 2400.0 which is used for EME and satellites*

- *In addition the amateur satellite service uses the band immediately above 2400 MHz (2400.0 to 2410.0 MHz) for downlinks. Consequently there is a need for a very sharp cut off on the block edge mask for channels immediately below 2400MHz where it would be used by a 24/7 type application.*

With regard to ATV those involved here adhere to the UK band plan for this mode. The segments in use are 2322 to 2355 MHz and 2370 to 2390 MHz for ATV and ATV repeaters (2435 and 2440 MHz are also used for ATV repeater outputs).

The AREN group which is mentioned in the introductory section to this response are at present in the early stages of formulating a plan to use the 2.3 GHz band. The plan would involve the provision of a high speed backbone on the band 5650-5850 MHz between Waterford City (Carraigferish) and Dungarvan (Helvic Head) and possibly on into East Cork via a link to an existing wireless broadband system. At both of these sites the plan envisages access nodes on the 1240-1300 MHz and the 2300-2400 MHz bands. Access would also possibly be provided from a site in East Cork. Such an arrangement would allow AREN to provide a digital communications capability across these areas and with the use of the 1200 and 2300 MHz bands allow connectivity to the network from anywhere between 2 and 15 kilometres away from the main nodes. Waterford County Civil Defence is involved in the planning process and is very supportive of the initiative.

It is not clear from the consultation paper whether it is intended to use guard bands between the different user segments. If it is proposed to use guard bands, the judicious placing of these, that take account of amateur use and of the IARU band plan, could assist the amateur service in continuing to make effective use of the band.

4. Response to Questions

Response to Question 1: While it is recognised that there is a demand for additional services in the 2.3 GHz band, we would not be in favour of releasing the entire band for consumer based services. Rather we would prefer to see an approach that took account of both the existing users, including the amateur service, as well as

allowing some new additional consumer based services. This could be done by segmenting the band between the current users and the new uses.

Response to Question 2: Types of licenses: Designating part of the band for use by closed user groups could, depending on the type of use, create a segment that would be more compatible for the amateur service to also use. Licenses within the band 2,300 to 2,400MHz should not be awarded on an exclusive basis as this could preclude the amateur service continuing to have access to the band.

Response to Question 7: We are concerned that while protecting current users is referred to (particularly SAP/SAB) there has been little or no indication on the protection of the amateur service which like SAP/SAB also has a secondary allocation in the band. As indicated in response to Q1 the possible segmenting of the band between current users and new uses would afford greater protection to the current users from new uses, which would more likely be operating on a 24/7 basis. Considering the existing uses (particularly RURTEL) we would propose that the band below 2330 MHz be reserved for the current uses. In addition if the band were to be segmented between current and existing uses then ComReg should consider upgrading the current uses of SAP/SAB and Amateur from secondary to primary on a national basis.

Response to Question 10: Duration of licenses: As indicated (sections 3.2 & 5.2 of the paper) there is currently no European harmonised approach for the use of the band. We would be concerned at the awarding of 10 to 15 year licenses if this would inhibit Ireland adopting any future harmonised approach to the use of the band, which we would hope would make some provision for continuing amateur use. Indeed we note the comments in the consultation document (Section 3) concerning the unavailability of the 2.6 GHz MMDs band for other electronic communications services and believe that ComReg should not repeat this situation with the 2.3 GHz band by issuing long duration licenses ahead on any possible European harmonisation.

5. Conclusion

The report of the Working Group on Spectrum Policy published last year by the Department of Communications, Energy & Natural Resources reflects the value of the amateur service, where it stated:

> *"Spectrum reserved for use by amateurs and for science research is vital in helping to ensure an ongoing interest in technology and in furthering our understanding of radio propagation and communications."*

The 2.3 GHz band forms an important part of the overall package of spectrum available to the amateur service. In fact the 2.3 GHz band is an important 'gateway' band for beginners in microwave operation. Furthermore with the availability of commercial equipment that can be readily adapted for use on the band coupled with the increased availability of components and of excellent kit sets, at a reasonable price, there is an increase in interest in experimenting with this band. As indicated above, AREN are at present formulating plans which would involve the use of the band for high speed digital communications in the South East and possibly on into East Cork One possible way that ComReg could give practical application to the importance of spectrum for the amateur service as outlined in the DCENR policy paper, would be to designate a part of the band as a primary allocation for the amateur service on a national basis, while leaving the amateur service in the remainder of the band 2.3 to 2.45 GHz as a secondary allocation. The IRTS would be willing to discuss this further with ComReg in order to identify the most suitable segment for upgrading to primary on a national basis, though our initial proposal would be for the segment 2300 to 2330 MHz.

12 Mr. Jim Mc Bride

Jim McBride
106 Blarney St.
Cork

25th July 2009

Ms. Sinead Devey
Commission for Communications Regulation
Irish Life Centre
Abbey Street
Dublin 1

Reference: Submission re ComReg 09/49

Dear Ms. Devey,

I am writing this submission as a private individual with no vested interested in the allocation of this 2300-2400MHz spectrum. However, I do believe that maximum use should be made of the 2.3GHz band, especially when considering recent OECD statistics on broadband penetration.[1] These figures show that Ireland ranks 21st out of 30 at the end of 2008 with just 20.57 subscribers per 100 inhabitants. This compares with a figure of 37.2 in Denmark which comes first in the rankings. Limited or no availability of broadband services in many parts of Ireland is a serious concern to both businesses and consumers.

In particular, I note in the consultation paper, "Release of Spectrum in the 2300 – 2400 MHz band", that Comreg proposes not to assign frequencies in the 2300-2330MHz range in geographical regions where Rurtel operates. Similarly, Comreg proposes not to assign 2300-2330MHz in geographical areas where Dáil TV operates. The current consultation on release of spectrum in the 2.3GHz band should also include the Rurtel and Dáil TV allocations and, in my view, question:

(1) whether these two legacy allocations are being fully utilised at present and
(2) whether stakeholders would be better served if the 2300-2330MHz frequencies were assigned to other technologies now, or at some point into the near future.

Rurtel

The Comreg website shows that large areas on the west coast of Ireland will have 30MHz of the 2.3GHz band assigned to Rurtel.[2] The aim of this allocation is to "provide telephony services to customers in rural areas of the country where it is not economically viable to provide copper to the premises". However, submissions by representative groups to the Joint Committee on Communications, Marine and Natural Resources strongly suggest that the current Rurtel system poorly serves the customers in these areas and is unreliable.[3] Considering that the Rurtel allocations are in areas which currently find it most difficult to source a suitable broadband service, one must question whether the Rurtel allocation in these locations really represents the optimal use of these frequencies. Comreg should, I believe, review the Rurtel allocation by asking the following questions:

1. How many customers currently avail of the Rurtel service?
2. What is the geographical spread of these customers?
3. Does this geographical spread warrant the allocation of Rurtel frequencies across *all* of the licensed areas on the west coast?
4. What is the level of customer satisfaction with the service?

5. Do alternative technologies exist for the provision of an equivalent or superior service to existing Rurtel customers?

Dáil TV

Comreg proposes to assign the 2300-2330MHz range to Dáil TV in the Dublin area. However, the proposed licence area extends far beyond Dublin, into neighbouring counties such as Kildare and Wicklow.[2] The current consultation is an appropriate time for a review of this frequency allocation. The following questions should be dealt with during this period:

1. What is the justification for such a large licence area if the service is limited to Dublin?
2. How many end users currently avail of this service?
3. In light of the proposed Oireachtas TV channel on DTT, will this Dáil TV allocation not represent unnecessary and wasteful duplication?
4. Given the ready availability of IP streams provided by the Houses of the Oireachtas, does this not render Dáil TV redundant?

Having answered the above questions, Comreg may still come to the conclusion that these two legacy services deserve some frequencies in the 2300-2400MHz range. If that is the case, then Comreg should then examine the allocation of 30MHz of bandwidth to Rurtel and Dáil TV. Considering that Rurtel currently only has a 20MHz allocation (2307–2327MHz) and that Dáil TV has a mere 8MHz allocation (2308-2316MHz) in the 2.3GHz band, on what basis is this increased bandwidth justified? With advances in compression technologies for both audio and video, surely a reduction, rather than an increase, in bandwidth should be proposed even when allowing for the possibility of interference?

Thank you for your consideration in this matter.

Yours Sincerely,

Jim McBride

[1] http://www.oecd.org/dataoecd/21/35/39574709.xls
[2] http://comreg.ie/radio_spectrum/google_map.704.googlemap.html
[3] http://debates.oireachtas.ie/DDebate.aspx?F=MAJ20051108.xml&Ex=All&Page=4

13 Meteor Mobile Telecommunications Ltd.

Meteor Mobile Communications Ltd.
Response to ComReg Consultation 09/49

Release of Spectrum in the 2300-2400 MHz Band: Proposed Options and Licence Conditions

29th July 2009

Executive Summary

Meteor Mobile Communications Ltd. (Meteor) welcomes the opportunity to respond to ComReg consultation document, 09 /49, Release of spectrum in the 2300-2400 MHz band, proposed Options and Licences Conditions.

Radio spectrum is a resource of huge economic importance for the Irish economy. Proper management of that resource is vital for both network operators and users to ensure that future access is administered in a manner that is open, transparent and above all efficient.

Operators require national regulatory authorities to provide a framework in which to allow for the provision and development of products and services. Such a framework is best delivered in a coordinated fashion across the European Union, ensuring that Ireland benefits to the maximum extent possible from the economies of scale generated by internationally harmonised use. We believe that such co-ordination should take place after international standards have been established and not in advance of same in a speculative manner.

We would urge caution in respect of the timing of the award process for spectrum in the 2300MHz band. It is anticipated that ETSI will publish a System Reference document for this band during 2010. In the absence of a System Reference document there is no certainty on timelines for the availability of vendor equipment for technologies such as 3G, LTE and WiMax for example. This would present major difficulties for operators to develop strategies around the spectrum at this time.

Developments in the mobile sector necessitate substantial increases in access to IMT harmonised spectrum capacity. The availability of mobile expansion spectrum is currently constrained in Ireland. National policy has yet to be established in respect of the 800MHz band and in the absence of a clear DTT transition plan, the timescales for release are unknown. Whilst there is an ongoing consultative process to determine policy in respect of liberalised licensing in the 900MHz band, ComReg's most recent proposals (as set out in ComReg 09/14) carry with them a significant amount of uncertainty for existing users of the band. In addition, ComReg has proposed to park consideration of liberalisation of the 1800MHz band until a later date.

ComReg states in the consultation that the 2600MHz band is currently licensed for alternative services and will not be available for use in the short to medium term. It is anticipated that the 2600MHz band will be important for mobile expansion across Europe. It would be extremely unfortunate if Ireland is not in a position to exploit the resulting economies of scale as a consequence of past regulatory decisions. Further clarity is required in respect of the future licensing of the 2600MHz band in Ireland.

If, as is suggested by ComReg, access to the 2600MHz band is constrained in the medium term, harmonised spectrum in the 2300MHz band for mobile expansion is likely to be of strategic significance in Ireland. At the current time there is no clear evolutionary path for mobile spectrum in Ireland and the evolution of regulatory policy is being approached on a band by band basis.

Meteor would therefore urge ComReg to undertake a comprehensive holistic review of mobile spectrum availability in Ireland and to await the outcome of ongoing international standards development work prior to developing detailed plans for releasing spectrum in the 2300MHz band.

1. **ComReg proposes to release additional spectrum for licensing in the 2.3 GHz band. Do you support ComReg's proposal to release spectrum in the band? Are there other issue, besides those identified above, which ComReg needs to take account in releasing spectrum in the band? Please give reasons for your answer.**

Whilst Meteor welcomes consultation on the proposed release of spectrum within the above band, we are concerned that this consultation is considering releasing the band with proprietary technical parameters in advance of international standards. The ITU has identified spectrum within this band for International Mobile Telecommunications (IMT) and international standardisation work is ongoing to establish harmonised technical parameters for this band. The benefits of international harmonisation to Irish consumers cannot be overstated. Meteor believes it is vitally important that every effort is made by Irish authorities to coordinate band plans and align assignments respecting the broader EU plans for this band. We believe that such co-ordination should take place after international standards have been established and not in advance of same in a speculative manner.

In general terms it can be stated that Ireland enjoys a relatively advantageous position in Europe in terms of spectrum availability. However this can not be said in the specific case of spectrum for mobile services in the near term. Increased take-up of mobile broadband and advances in technology such as LTE (with channel sizes of up to 2x20MHz) will necessitate substantial increases in access to IMT harmonised spectrum capacity. Internationally it is anticipated that expansion spectrum for mobile services will come from the 2600MHz, 2300MHz, and 800MHz bands, in addition to the existing bands in operation (900MHz, 1800MHz, and 2100MHz). The availability of mobile expansion spectrum is currently constrained in Ireland.

National policy has yet to be established in the respect of the 800MHz band and in the absence of a clear DTT transition plan, the timescales for release are unknown. Whilst there is an ongoing consultative process to determine policy in respect of liberalised licensing in the 900MHz band, ComReg's most recent proposals (as set out in ComReg 09/14) carry with them a significant amount of uncertainty for existing users of the band. In addition ComReg has proposed to park consideration of liberalisation of the 1800MHz band until a later date.

ComReg states in the consultation that the 2600MHz band is currently licensed for alternative services and will not be available for use in the short to medium term. It is anticipated that the 2600MHz band will be important for mobile expansion across Europe. It would be extremely unfortunate if Ireland is not in a position to exploit the resulting economies of scale as a consequence of past regulatory decisions. Further clarity is required in respect of the future licensing of the 2600MHz band in Ireland.

If, as is suggested by ComReg, access to the 2600MHz band is constrained in the medium term, harmonised spectrum in the 2300MHz band for mobile expansion is likely to be of strategic significance in Ireland. At the current time there is no clear evolutionary path for mobile spectrum in Ireland and the evolution of regulatory policy is being approached on a band by band basis. Meteor urges ComReg to undertake a comprehensive review of mobile spectrum requirements and adopt a strategic and holistic approach.

We would urge caution in respect of the timing of the award process for spectrum in the 2300MHz band. It is anticipated that ETSI will publish a System Reference document for this band during 2010. In the absence of a System Reference

document there is no certainty on timelines for the availability of vendor equipment for technologies such as 3G, LTE and WiMax for example. This would present major difficulties for operators to develop strategies around the spectrum at this time.

Meteor respectfully suggests that the timing of the award and the technical parameters applied should be informed by international decisions. We believe that further consideration of the 2300MHz band should be undertaken within a comprehensive national framework aimed at promoting sufficient mobile spectrum for the evolution of services. At the very least we feel that further consideration of the 2300 band must be undertaken in parallel to establishing a proportionate policy for the liberalisation and licensing of spectrum in the 1800 band and establishing national policy for the future licensing of the 2600MHz band.

2. **Which of the licence types outlines above, in your view are the most appropriate for the 2.3 GHz band: national, regional, local or closed user group? Please cite reasons for your answer**

As the section of the band between 2300MHz and 2330MHz is currently occupied by the Rurtel system and Dail TV in differing geographic locations it would seem a realistic approach to treat licensing in this section of the band on a local user/closed group basis. A national license approach to the remaining 2330MHz to 2400MHz section would seem the most appropriate option given the anticipated spectrum capacity requirements of the mobile sector. Capacity from higher frequency mobile spectrum bands will support the roll-out of advanced mobile services in populated areas (large villages, towns and cities) which cannot be defined on a regional basis. National licensing will also allow licensees to better control in-band interference ensuring delivery of a higher quality of service.

3. **Do you believe that there is a possibility for a combination of all or some of the above in the 2.3 GHz band and, if so, in what way? Please set out your suggested approach.**

Yes. See reply to Question 2 above.

4. **If you believe that there should be a combination of licence types in this band, how much spectrum should be allocated to each of the licence types defined in Question 2? For example, if you recommend in response to Question 2 that spectrum should be released on a national and regional basis, how much spectrum should be allocated to each licence type? Please give reasons for your answer.**

See reply to Question 2 above.

5. **If you believe that licences in this band should be offered on a regional basis, on what basis should ComReg determine the regions, i.e. provinces, groups of counties? Please support your response as appropriate.**

As highlighted in our response to question 2, Meteor does not believe that licences in this band should be offered on a regional basis.

6. **If you believe Local Area licences to be the superior choice what geographic area should these licences incorporate and on what basis? (for example, FWALA licences incorporated service area 20 KM from defined centre point of licence). What conditions should ComReg**

implement to mitigate potential interference between users using the same spectrum in adjacent geographical areas?

For the 2300MHz to 2330MHz section of band, Meteor considers that local area licences and the same guidelines / procedures as applied to FWALA would seem most appropriate.

7. **In order to protect current users of the 2.3 GHz band , ComReg proposes that any potential licences offered in the range 2300-2330 MHz would be released on the basis of local area or closed user group licences only. Do you agree with this proposal? If not, please give reasons for your answer.**

Yes, Meteor would agree with this proposal.

8. **Do you agree with ComReg's proposal that if this spectrum is offered on a national or regional basis, it should be by means of an auction or auctions? Do you agree with ComReg's proposal to release any spectrum for local area licensing under a beauty competition? Please supply reasons to support your response.**

Meteor agrees that unassigned spectrum in the 2300MHz band could be awarded by way of a competitive auction. For an auction to be efficient potential bidders need to be able to determine a value for the spectrum. In the case of the 2300MHz band there are a number of major unknowns that need to be clarified before an auction process can be commenced. These include:

- Establishing clarity in respect of national policy towards release of substitutional / complimentary spectrum in the 1800MHz and 2600MHz bands
- Clarity on international standards for the band which will inform decisions on optimal use of the band and timing of equipment availability.

9. **Do you agree with ComReg's proposal to use benchmarking to assist in setting a fair licence fee for the spectrum? Alternatively, do you believe there is an alternative, superior method for setting the fees? Please supply reasons to support your response.**

Meteor does not agree with ComReg's proposal to use benchmarking in the case of spectrum that is assigned by way of a competitive auction. The primary rationale for using auctions is as a means to establish the market value of spectrum. Consequently the auction outcome should determine the fee. The auction design should incorporate a proportionate phased payment schedule, over the minimum term of the licence duration, to determine the amount payable each year by the licensee.

10. **Do you agree with ComReg's proposal to make licence duration of spectrum in the 2.3 GHz band between 10-15 years long? Please supply reasons to support your response.**

Meteor does not agree with ComReg's proposal for finite licence durations between 10 to 15 years long. Investment in communications infrastructure is substantial and multi-annual. Thus while we would agree that consideration needs to be given to provide predictability and affording licensees an adequate period to see a return on investment we believe that these objectives are best achieved by establishing rolling

licences with a minimum duration. This will create a licensing framework supportive of continued investment and service evolution.

11. Do you agree with ComReg's proposal to limit the amount of spectrum available to any given operator to 30 MHz for a given area? Please supply reasons to support your response.

Meteor agrees in principle with the concept of spectrum caps. However we do not agree that consideration of spectrum caps should be limited to a specific band. As highlighted earlier a holistic strategic view is required in respect of mobile spectrum availability. Consequently it may be appropriate to establish total spectrum caps across a range of relevant bands. Such an approach is under consideration in other jurisdictions (see for example UK policy proposals set out in the Report from the Independent Spectrum Broker, 12th May 2009). We believe multi-band spectrum caps should be investigated further within a comprehensive strategic review of mobile spectrum.

In the consultation document ComReg proposes a band specific cap of 30MHz. Without prejudice to the foregoing Meteor would observe that:

For the 70MHz (2330 – 2400MHz) that could be allocated on a national basis, a 30 MHz allocation could limit access for multiple operators. In ComReg's consultations on the liberalisation of the existing GSM900 band (also 70 MHz in total) a maximum 2 X 10 MHz (or 20 MHz in total) per single operator allocation is envisaged. Consequently in the case of the 2300MHz band a 20 MHz cap may be a more suitable limit. However if the liberalisation of the current GSM1800 band along with the release of the unallocated spectrum within that band were considered in conjunction with 2300 MHz, then a higher total spectrum cap may be conceivable and more desirable.

As mentioned previously, a System Reference document for the 2300MHz band has yet to be finalised by ETSI. As such no decisions have been taken regarding duplex arrangements. It may be noted that the NGMN alliance have recommended this band be TDD and not FDD. This would be a major consideration for an operator's strategy if implemented and a significant influence on appropriate caps.

We agree it is appropriate the existing holdings of licensees (Dail TV and Rurtel) should not count towards spectrum caps in respect of newly licensed spectrum in the 2300MHz band.

12. Do you agree with ComReg's proposal to attach utility conditions to any potential licences in this band? If not, why? Please provide reasons for your answers.

Meteor agrees it is important to ensure the risk of spectrum hoarding is mitigated. Consequently Meteor is supportive in principle of some form of 'use it or lose it' provision. However, as noted earlier, the international standardisation process for this band is ongoing and, as yet there is no indication as to when vendors will make mass market network and terminal equipment available for this band. Any 'use it or lose it' provision in the near term would therefore need to be sufficiently flexible to ensure that a successful applicant with IMT aspirations does not lose its licence while awaiting availability of IMT equipment.

13. In your view what would be the most appropriate channel spacing for the 2.3 GHz band? Please give detailed reasons for your answer.

Meteor observes that a 5 MHz spacing would seem the most appropriate spacing in line with such technologies as 3G,LTE and WiMax. However such definition will be covered by ETSI System Reference document for the band when published next year. Consequently we believe that national decision making should await and be informed by international standards decisions.

14. **Do you support ComReg's proposed power limit? If not, please set out the reasons for your answer.**

Meteor does not support ComReg's proposed power limit. As highlighted previously we would strongly caution against the adoption of proprietary national technical parameters for this band. Such definitions will be covered by ETSI System reference document for the band when published next year.

It may also be noted that the proposed maximum Mobile Base Station EIRP of 200 Watts(53 dBm) is relatively low compared to typical maximum carrier power of 20 Watts (43 dBm) for say 3G technology combined with a typical antenna gain of 18 db for a total EIRP of **61 dBm**. Even with a cable loss at Mobile base station of 1 to 2 dB this amounts to an EIRP of approximately 60 dB (10000 Watts).

EC guidelines (2008/477/EC) for the 2600MHz band reflect this higher figure of 61 dBm (See excerpt below from EC decision).

"***Block specific requirements — Base Station in-block e.i.r.p. BEM***
Maximum in-block e.i.r.p. + 61 dBm/5 MHz
NB: Member States can relax this limit to 68 dBm/5 MHz for specific deployments e.g. in areas of low population density provided that this does not significantly increase the risk of terminal station receiver blocking."

Meteor would also observe that the proposed maximum Mobile terminal power of 5 Watts(37 dBm) is relatively high compared to EC guidelines (2008/477/EC) for the 2600MHz band regarding mobile terminal power, of 31 dBm.(See excerpt below from EC decision).

"***In-block power limits for terminal stations***
Maximum mean power (including Automatic Transmitter Power Control (ATPC) range)
Total radiated power (TRP) 31 dBm/5 MHz
e.i.r.p. 35 dBm/5 MHz
NB: E.i.r.p. should be used for fixed or installed terminal stations and the TRP should be used for the mobile or nomadic terminal stations. TRP is a measure of how much power the antenna actually radiates. The TRP is defined as the integral of the power transmitted in different directions over the entire radiation sphere."

15. **Do you agree with ComReg's proposal to adapt the Block Edge Mask that applies to the 2500-2690 MHz band to the 2.3 GHz band, once a channel bandwidth has been agreed? Please provide reasons to support your response.**

Meteor does not agree with ComReg's proposal. Such definitions will be covered by ETSI System reference document for the band when published next year.

16. **Do you agree with ComReg's proposal to impose the unwanted emission limits detailed above? Please support reasons to support your response.**

Meteor does not support this proposal. Please see our response to Question 15 above.

14 NUI Maynooth

Institute of Microelectronics and Wireless Systems, NUI Maynooth

Response to the COMREG Call for Comment on 2.3 GHz Licensing

YES, we support the licensing of the 2.3 GHz band

We support a combination of national, regional, local and closed user group types of licenses in the 2.3Ghz band. A national license would enable a commercial operator to provide a national service which has many benefits for the consumer along with the possibility of introducing additional competition between different technology platforms (this national license should have a relaxed coverage requirement, if one at all)

The difference between regional and local licenses becomes blurred at 2.3Ghz due to the better propagation characteristics of 2.3Ghz in comparison to 3.5Ghz for example, and it's difficult to see what the distinction between regional, national and local licenses would be in practice.

For local licenses, we would like to see greater flexibility in what is defined as a local area than what is traditionally defined by COMREG. To date, most licenses in the 2.3-2.5 and 3.4-3.8 GHz bands assume common power and areas are defined by circles centred on the transmitter. In practice systems often operate on much smaller power levels (thus lower range) and are sectorised, thus currently banning many areas where a low power local license could be used without interference. Thus if you are to be serious about local areas, a more rigorous approach to defining interference zones would need to be followed. Or in summary, we would like to see smaller distance boundaries being applied to local licenses. We're a university site, 2km's and 2 watts transmission power is all we'd need for our systems.

We support provision of spectrum to closed user groups, be them universities (best managed perhaps by HEAnet) or social groups. This spectrum is very useful in that regard and to date most non-commercial radio users have been prevented from accessing spectrum. I believe that providing local-area closed-user groups with spectrum will encourage creative use of spectrum, in line with government and ComReg strategy in developing creative applications of telecommunications in Ireland. It would also tend to provide greater employment. As a university, we have a WiMAX network operating in this frequency range, allowing for continued access to this frequency would allow further development of our research and educational programmes using WiMAX and other novel radio systems.

Q. 3. Do you believe there is a possibility for a combination of all or some of the above in the 2.3 GHz band and, if so, in what way? Please set out your suggested approach.
..... 14

We support the proposal to retain 30 MHz for closed user groups and recommend at least two national or regional bands of 30 MHz bandwidth in the remaining spectrum. There may be an argument in the case for a single 70 MHz band for commercial spectrum where a strong national competitor to the existing telephony services presents themselves.

The closed user groups can be split on a case-by-case basis spatial and spectrally. Not all groups will require 30 MHz and thus there may be an option to modify local licenses based on need. Again the objective would be to maximize the number of potential users in the local/closed-group band.

Q. 4. If you believe that there should be a combination of licence types in this band, how much spectrum should be allocated to each of the licence types defined in Question 2? For example, if you recommend in response to Question 2 that spectrum should be released on a national and regional basis, how much spectrum should be allocated to each licence type? Please give reasons for your answer.
..... 14

National/Regional Licence – 2 x 30MHz (or one 70 MHz band for a national competitor)

Local/Closed user group – 1x30MHz , 2x15 or 3x10 (or as suitable on an non interference basis). The closed-user group licenses are for specific purposes and may not need the full spectrum allocation. Care would need to be taken to avoid first-come reservation of all 30 MHz, unless a specific case can be made.

Q. 5. If you believe that licences in this band should be offered on a regional basis, on what basis should ComReg determine the regions, e.g. provinces, groups of counties? Please support your response as appropriate. 14

Difficult to see on a small island how regional works due to the interference zones. If this were to be done, it should be done on the basis of geographic isolation

Q. 6. If you believe Local Area licences to be the superior choice, what geographic area should these licences incorporate and on what basis? (For example, FWALA licences incorporate service area 20km from defined centre point of licence). What conditions should ComReg implement to mitigate potential interference between users using the same spectrum in adjacent geographical areas?
..... 14

I believe local licenses are a superior choice over regional licenses

I think the FWALA service areas are flawed as they assume omnidirectional systems. In practice this will be rare, and I believe directionality of antennas (and thus orientation) should be factors in the license application and in understanding the interference zones. Appropriately orientated antennas will solve most problems in adjacent local-area systems.

I think there should be greater flexibility on the power levels authorized. In the local scenario, most applications will not beginning to approach the possible power levels of modern WiMAX (for example) type systems.

Finally, one common source of interference is in TDD systems that utilize different timing schemes. A co-operative approach would ease many of the issues that could arise in adjacent areas. To date there is no compulsion or incentive on anyone to cooperate. This could be made a requirement for the smaller user groups.

Q. 7. In order to protect current users of the 2.3 GHz band, ComReg proposes that any potential licences offered in the range 2300 – 2330 MHz would be released on the basis of local area or closed user group licences only. Do you agree with this proposal? If not, please give reasons for your answer. 14

HEAnet agrees with this proposal, but licenses should be awarded on a non-interference basis and not an explicit exclusion zone as proposed. It is possible to award local area licenses in this range where Rurtel and Dail TV also operate on a non-interference basis. Rurtel and Dail TV both currently under utilize the geographical areas their licenses cover. More specificially Rurtel is generally a directed radio link to provide equivalent landline connectivity. This will not be affected by most local applications and considering the potential for replacement of Rurtel services with more capable equivalents, it would be disappointing to deprive the west coast communities from what could be a very useful opportunity. Equally Dail-TV has a huge exclusion area covering over 30% of the country's population. DailTV by Aervision is used to transmit only to government offices and a couple of point-to-point links. Considering that this is now served live over the internet, excluding 30% of the country for what is a very local area system (and some point-to-points) seems to be extreme.

So in that case, the argument should not be on a geographical exclusion zone but on the basis of interference.

Q. 8. Do you agree with ComReg's proposal that if this spectrum is offered on a national and/or regional basis, it should be by means of an auction or auctions? Do you agree with ComReg's proposal to release any spectrum for local area licensing under a beauty competition? Please supply reasons to support your response. 15

Nationally, no opinion

Local area/closed user groups: We support a beauty competition however we would disagree with using the comparative evaluation scheme that was used for the FWALA licenses. In that scheme, the bias was heavily towards commercial use of the spectrum. As a university group, we would not be a commercial user and thus would be heavily disadvantaged. Equally there may be small communities who wish to provide a non-commercial service that would be disadvantaged. If a beauty contest were to be held then the comparative evaluation metrics would need to change to something such as "value to community" rather than purely commercial terms – unless this was your intention for local area usage, an intention I strongly discourage.

For commercial use of the spectrum, then either an auction or a benchmarked fee system would be acceptable. This spectrum is highly valuable and the only risk here is that the spectrum is not yet properly valorized in other countries. For non-commercial or closed-user groups, an alternative structure may be required as even pro-rata, the costs could be high.

Yes, HEAnet believes for a national license 10-15 years is reasonable. For regional, local and closed user groups shorter terms should be considered.

No. this is acceptable as a condition for the initial issuance of spectrum however in the case of a successful vendor, they should be able to later purchase additional spectrum where there is need for capacity (with ComReg's permission). Placing an artificial constraint on spectrum could limit a successful market player and minimize the usefulness of remaining spectrum. Considering the proposals in Q12, there is no point having the cap if a "use it or lose it" may mean that spectrum becomes available and the successful player cannot avail of it.

Yes, both options are suitable. I think the second option of degrading a national license to a regional license is particularly interesting, particularly if that spectrum could be made available to local groups, or other more successful operators (if they are allowed to exceed a possible 30 MHz cap).

None, I do not see the point of channel spacings. This implies a presumption of technology choice which is counter to the WAPECS proposal. Let people use it as they see fit. Depending on the technology vendors, one spacing may be more appropriate than another, equally the applications may require one spacing over another. I do not see why you need to be concerned about this provided that there is a

requirement to avoid interference (which refers more to guardbands). If the ITU defines channels, then from a standardization perspective, it would acceptable to accept the ITU standard.

The power limits are generous and possibly higher than needed for the spectrum range being proposed. I would specifically argue against the fixed CPE's being allowed a 25 Watt power level. These units can gain increased performance from improved antennas. From a public perspective, 25 watt units in the home will raise increased concerns about safety. Equally the move in basestations is away for the hundreds of watts to lower power levels, but it's acceptable to have 200 watts as maximum power levels for these.

I do not believe that channel bandwidths are required however from a filter availability perspective, a 5 MHz BEM (as suggested) would be acceptable for the higher bandwidth licenses. If narrower bandwidths were to be provided (for say the local area licenses), then narrow BEMs would be acceptable though would incur slightly greater equipment cost. Again, I think this should be driven by an interference requirement rather than an explicit MHz figure.

Yes

15 Mr. Peter Grant

Response to the Consultation Paper On the 2.3 – 2.4 GHz Band

COMREG Document 09/49

SUBMISSION

15.1 From Peter Grant EI4HX

Licenced Radio Experimenter.

37 Glenmore Park

DUNDALK
Co LOUTH

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Page 1. Cover Sheet

Page 2. Comment Sheet

15.2 Response to Consultation Document 09/49.

COMREG July 2009

I have adjusted some of the suggested frequencies proposed in the Consultation Document.

See page 3, Excel Worksheet.

And I have indicated the sections of the band, already in use on an International Basis, by Amateurs around the world.

It would seem that at present the current allocations are favourable on an on going basis.

Alternatively there is a growing need for a section of bandwidth to be reserved for "in the clear", Live Satellite Downlink.

I have proposed this allocation be considered in the region of 2392 - 2400 MHz.

This could be seen as a "Guard Band", and would allow for Current and future Technologies
To be used Internationally, with a guarantee of no interference.

The current allocation in neighbouring Countries, have allocations for Short Range Devices in the Presently designated "Amateur Satellite" Bands around 2400 MHz, On a shared Basis.

As this (Amateur Satellite) Mode, is to be used as part of the International Allocation for "Amateur Satellite" in the near future. I

propose that it be considered at this time. On this band segment. Here in Ireland.

Thank you for the opportunity for this response.

_____ Peter Grant

Page 3. Excel Document, Current / Proposed Current Usage.2.3 – 2.4 GHz

2303.9	2303.9		Intercontinental EME (Earth Moon Earth)				YES
2303.9	2304.1		Split Frequency EME Intercontimental				YES
2304.3	2304.32		International Beacons				YES
2304.32	2304.4		International Beacons				YES
2304.9	2305		Intercontinental Beacons				YES
2305	2307		Amateur (Secondary)				YES
2307	2327		RURTEL		20 MHz		YES
2308	2316		Dail TV. 8MHz				YES
2307	2327	20 MHz		Amateur (Secondary)			??
2327			Proposed	SAP/SAB (Wireless Cameras)			NEW
			)				
			)	Amateur Secondary			YES
		65 MHz	)				
			)	SAP/SAB (Wireless Cameras)			NEW
	2392			Amateur Secondary			YES
2392	2400	8MHz	GUARD BAND…Proposed Clear Satellite Downlink			Downlink	PLEASE
2400	2403		Amateur Satellite				YES
2403	2408		Amateur Satellite		SECONDARY		YES
2408	2410		Amateur Satellite				YES

2430	2433	Amateur Satellite	YES
2433	2438	Amateur Satellite	YES

Page 3. Submission of Peter Grant EI4HX. Dundalk.

_____ Peter Grant EI4HX. Licenced Radio Experimenter.

16 Telefonica O2 Ireland

1. Introduction

Telefonica O2 Ireland (O2) is pleased to respond to ComReg's consultation on the release of spectrum in the 2.3GHz to 2.4GHz band (2.3GHz). Wireless communications has played a vital role in the growing availability broadband and voice communications services in Ireland, and it can play a pivotal role in the development of the infrastructure needed to underpin the Smart Economy.

As ComReg has stated, Ireland is in a relatively advantaged position when it comes to the availability of radio spectrum – our population density is relatively low, and we don't have difficulties of International co-ordination to the same extent as some other European countries.

ComReg needs to create a situation whereby operators can take a holistic approach to planning their networks use of different bands and technologies – there are several bands where spectrum might become available in the short to medium term, including 800MHz, 900MHz, 1800MHz 2.3GHz and 2.6GHz. In addition there are several technologies that could be deployed in these bands, including 3G, LTE, and Wimax. ComReg should provide the maximum transparency to operators on the availability of the different bands so that decisions do not need to be made on any individual band or technology in isolation.

Q. 1. ComReg proposes to release spectrum for licensing additional services in the 2.3 GHz band. Do you support ComReg's proposal to release spectrum in the band? Are there other issues, besides those identified above, which ComReg needs to take into account in releasing spectrum in the band? Please give reasons for your answer.

O2 supports any initiative that will release radio spectrum for use, and any process that provides transparent information on the terms for making that spectrum available. It is noted that while 2.3GHz is a 3GPP band, there are still some uncertainties that remain regarding the availability of standardised equipment. This introduces an element of uncertainty for operators regarding the use of the band. So far LTE does not include provision for voice and text messaging, which means the services provided in this band will be somewhat different than traditional mobile service. This will have some bearing on the business model and whether there should be national roll-out obligations for use of the band.

Q. 2. Which of the licence types outlined above, in your view are the most appropriate for the 2.3 GHz band: national, regional, local or closed user group? Please cite reasons for your answer.

The type of licence to be awarded in this band should be determined on the basis of what the potential applicants believe is most appropriate. O2 is of the view that ComReg should consider the feedback received in this consultation before deciding

on what type(s) of licence to issue. While ComReg needs to ensure assigned spectrum is efficiently used, O2 observes that the cost of roll-out of a national network in this band would be comparable to that for rolling out a national 3G service in the 2.1GHz band. This should be taken into consideration when setting roll-out requirements.

Q. 3. Do you believe there is a possibility for a combination of all or some of the above in the 2.3 GHz band and, if so, in what way? Please set out your suggested approach.

While there might be some possibility for a mixture of different licence types, this could add inefficiency to the use in the band. Multiple operators might use different equipment types such that there would be the need for guard bands between the different licence types, and either protection zones or close co-ordination between different regional licensees. This would lead to disaggregated use of the spectrum.

Q. 4. If you believe that there should be a combination of licence types in this band, how much spectrum should be allocated to each of the licence types defined in Question 2? For example, if you recommend in response to Question 2 that spectrum should be released on a national and regional basis, how much spectrum should be allocated to each licence type? Please give reasons for your answer.

O2 reserves it's view on this question at this time.

Q. 5. If you believe that licences in this band should be offered on a regional basis, on what basis should ComReg determine the regions, e.g. provinces, groups of counties? Please support your response as appropriate.

O2 is of the view that there is only limited scope for Regional licences – if they are to be offered, they should be formed around population centres taking into account suggestions received in response to this consultation rather than around county boundaries.

Q. 6. If you believe Local Area licences to be the superior choice, what geographic area should these licences incorporate and on what basis? (For example, FWALA licences incorporate service area 20km from defined centre point of licence). What conditions should ComReg implement to mitigate potential interference between users using the same spectrum in adjacent geographical areas?

It will be necessary to have a protection zone between different local licences, which could be substantial. This will reduce the efficiency of use of the band.

Q. 7. In order to protect current users of the 2.3 GHz band, ComReg proposes that any potential licences offered in the range 2300 – 2330 MHz would be released on the basis of local area or closed user group licences only. Do you agree with this proposal? If not, please give reasons for your answer.

O2 agrees with this proposal.

Q. 8. Do you agree with ComReg's proposal that if this spectrum is offered on a national and/or regional basis, it should be by means of an auction or auctions?

Do you agree with ComReg's proposal to release any spectrum for local area licensing under a beauty competition? Please supply reasons to support your response.

O2 is of the view that ComReg should take a consistent approach to the award process for different licences within this band, and indeed the approach should be consistent to the one taken in other bands also. ComReg needs to explain why a different approach is appropriate for different licence types within the band.

Q. 9. Do you agree with ComReg's proposal to use benchmarking to assist in setting a fair licence fee for the spectrum? Alternatively, do you believe there is an alternative, superior method of setting the fees? Please supply reasons to support your response.

O2 sees difficulties with the use of benchmarking as a means to determine the licence price. It will be difficult to find a direct comparator for the use of this band in Ireland. O2 is of the view that licence fees should be minimised as excessive licence fees will simply take away from the investment in the network or service. It is noted that if an auction is used, this will determine the licence price.

Q. 10. Do you agree with ComReg's proposal to make licence duration of spectrum in the 2.3 GHz band between 10 - 15 years long? Please supply reasons to support your response

O2 is of the view that indefinite term licences are better for ensuring ongoing investment in a network or service.

Q. 11. Do you agree with ComReg's proposal to limit the amount of spectrum available to any given operator to 30 MHz for a given area? Please supply reasons to support your response.

In general, O2 does not favour spectrum caps, however accepts that in certain circumstances it may be necessary to have a cap in place at the beginning of an assignment process in order to ensure there is a distribution of the available spectrum. The decision on this point will depend on the decision taken on the number and structure of licences to be awarded.

Q. 12. Do you agree with ComReg's proposal to attach utility conditions to any potential licences in this band? If not, why? Please provide reasons for your answers.

ComReg needs to either give an incentive for the licensee to release unused spectrum, or to have a method to recover it. However, O2 is of the view that these should be "safety controls" and that in the first place making the licences tradable would prevent spectrum hoarding.

Q. 13. In your view what would be the most appropriate channel spacing for the 2.3 GHz band? Please give detailed reasons for you answer.

ComReg should allow flexibility to the licensee to determine the most appropriate channel spacing – a 20MHz assignment could be broken into sub-channels by the licensee.

Q. 14. Do you support ComReg's proposed power limit? If not, please set out the reasons for your answer.

Where international standards exist for particular bands and technologies, ComReg should use these standards in the first place as a measure to limit interference. In the absence of such standards, it is necessary to impose safeguard power limits. O2 does not disagree with the limits proposed by ComReg in this case.
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17 UK Microwave Group

ComReg Consultation on:-
Release of Spectrum in the 2300 – 2400 MHz band
Document No: 09/49

Response by the UK Microwave Group
July 2009

About Us

The UK Microwave Group (UKuG, www.microwavers.org) was founded as a representative body for UK amateur radio enthusiasts who operate on the microwave bands. It is affiliated to the Radio Society of Great Britain (RSGB, www.rsgb.org) and the RSGB Spectrum Forum and collaborates closely with Amsat-UK and the British Amateur Television Club and fellow international groups who also have significant interests in amateur band operations at microwave frequencies.

Since its foundation ten years ago UKuG membership has expanded rapidly to several hundred active members and well beyond the UK. Membership includes operators in Ireland (EIs and GI&MIs), mainland Europe, Scandinavia, USA, Australia and New Zealand.

The 2.3GHz band supports the widest variety of operating modes and also sees Amateurs travelling/reciprocally operating, as well as direct long distance international operations (inc terrestrial, moonbounce and satellites). Consequently, the proposals for the 2.3GHz band in Ireland are of significant concern for our members and fellow amateurs.

We would highlight that our response to this consultation is intended to complement that of IRTS, which we fully endorse.

Permission is granted to place this response in the public domain.

General Points in regard of the Consultation

The 2.3GHz band as ComReg admits repeatedly in its own document is not harmonised in Europe for the applications foreseen (nor is it likely to be), nor in particular with usage just across the border/sea with its use in the UK.

It is deeply disappointing that current users are expected to suffer significant loss of spectrum due to a unilateral change of use, for what again would be an Irish-specific solution.

UKuG follows the international scene closely and realises there are number of important commercial developments in the wings such as 3G LTE and Femtocells (more likely in Europe than Wimax). Amateurs like any other citizen consumers are likely to utilise and benefit from these. Thus we strongly believe that the focus for facilitating new commercial systems should be on harmonising 2.5-2.69 and 3.41-3.5GHz in Ireland. These bands are fully harmonised in the rest of Europe (including the UK), and would maximise cross-border roaming, investment certainty, economic benefits, common consumer equipment and would importantly also see all existing users (such as Amateurs, SAB et al) far better protected.

As the more detailed IRTS input indicates there are a wide variety of amateur uses:-

- Long range narrowband operating in the UK, inc Ireland is clustered around 2320 MHz (inc operators, beacons and a fair proportion of EME) – in line with the IARU bandplan. UK Amateurs are currently expanding the 2320 MHz propagation beacon network and the ComReg proposal threatens reception of their weak signals and associated pioneering research which includes new and innovative JT4g modulation developments.

- Due to the nature of international allocations there are also some EME operations in the 2304 and 2396-2400 ranges.

- Due to excessive and growing interference from WiFi, 2400-2450 is barely used and would not be suitable substitute spectrum. Amateur Satellite downlinks are forced to operate at the very bottom of their 2400-2450 ITU allocation to mitigate WiFi interference. In conjunction with adjacent EME use we would therefore be concerned regarding change of use and high omnidirectional ERPs in the 2390-2400 area.

- The 2.3GHz band is the first to have sufficient room (and be free of radars etc) for modern data links, Amateur TV experimentation etc – all capable of showing the Amateurs Services in a highly innovative light to the wider community.

  In the event that ComReg does proceed to release the band we fully support the IRTS position that excluding the bottom end to create a national reserve of 2300-2330 would protect the vast majority of Amateur/SAB use and do so in a harmonised manner

In addition the block edge mask (or some form of guardband) is needed so that high powers and spurii do not hit either the 2300-2320 area or the 2395-2400 subband – In that respect we do not agree that the default 2.5-2.69 mask suggested is adequate when a mix of different services are present.

In addition to the above we make the following comments on certain questions:-

Q. 1. ComReg proposes to release spectrum for licensing additional services in the 2.3 GHz band. Do you support ComReg's proposal to release spectrum in the band? Are there other issues, besides those identified above, which ComReg needs to take into account in releasing spectrum in the band? .

Releasing this band should be a last resort not a first one. Priority should be given to releasing the 2.5-2.69 and 3.41-3.6GHz bands first in line with the UK and Europe

Account must certainly be taken of existing users and how those that might be displaced are fully protected or compensated

Q. 7. In order to protect current users of the 2.3 GHz band, ComReg proposes that any potential licences offered in the range 2300 – 2330 MHz would be released on the basis of local area or closed user group licences only.

The range 2300-2330 should be retained for existing users and no new commercial services released in that segment. In addition we seek an adequate guardband or mask mod at the top of the band to protect 2395-2400. Failing this, ComReg should consider complying with the EU Allocation tables and offer Experimenters access to 3400-3410MHz in line with ECA Table allocation footnote EU17 which is increasingly widely allocated to amateurs around Europe and beyond for weak signal operations (inc very successful EME)

Q. 10. Do you agree with ComReg's proposal to make licence duration of spectrum in the 2.3 GHz band between 10 - 15 years long?

This could result in long term disadvantage for harmonisation given that the UK and Europe will be releasing other bands for commercial services quite soon as noted in our earlier responses

Q. 13. In your view what would be the most appropriate channel spacing for the 2.3 GHz band?

Channel spacing should account for the probable need for guardbands or mask mods to protect existing services in adjacent blocks

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Q. 15. Do you agree with ComReg's proposal to adapt the Block Edge Mask that applies to the 2500 – 2690 MHz band to the 2.3 GHz band, once a channel bandwidth has been agreed?

We advocate that a specific BEM or guardband is incorporated into the bandplan so that existing adjacent users do not suffer harmful interference or high spurii levels. The current proposal is unsuited when differing services are adjacent to each other

upc

UPC Ireland response to ComReg consultation the proposed release of spectrum in the 2300-2400Mhz spectrum band (ComReg Document 09/49)

Introduction

1. UPC Ireland welcomes the opportunity to respond to the ComReg consultation on the proposed release of spectrum in the 2300-2400Mhz band.
2. [redacted]
3. [redacted]

Q. 1. ComReg proposes to release spectrum for licensing additional services in the 2.3 GHz band. Do you support ComReg's proposal to release spectrum in the band? Are there other issues, besides those identified above, which ComReg needs to take into account in releasing spectrum in the band? Please give reasons for your answer.

Answer: Yes we support the release of spectrum in this band.

On a separate note, ComReg may wish to consider whether there are any future plans to expand the Dail TV service beyond its current geographic reach and whether this will have any impact on ComReg's spectrum management plans.

Q. 2. Which of the licence types outlined above, in your view are the most appropriate for the 2.3 GHz band: national, regional, local or closed user group? Please cite reasons for your answer.

Answer: [redacted]

Q. 3. Do you believe there is a possibility for a combination of all or some of the above in the 2.3 GHz band and, if so, in what way? Please set out your suggested approach.

Answer: We believe that National licences are the most sensible approach and they encourage recipients to not just cherry pick the urban areas which are sufficiently serviced today. While regional licences may also be considered this should only be secondary based on remaining capacity on a case by case basis once the appetite for national licences has been fully met

Q. 4. If you believe that there should be a combination of licence types in this band, how much spectrum should be allocated to each of the licence types defined in Question 2? For example, if you recommend in response to Question 2 that spectrum should be released on a national and regional basis, how much spectrum should be allocated to each licence type? Please give reasons for your answer.

Answer: See above

Q. 5. If you believe that licences in this band should be offered on a regional basis, on what basis should ComReg determine the regions, e.g. provinces, groups of counties? Please support your response as appropriate.

Answer: UPC Ireland would have a preference for national licences.

Q. 6. If you believe Local Area licences to be the superior choice, what geographic area should these licences incorporate and on what basis? (For example, FWALA licences incorporate service area 20km from defined centre point of licence). What conditions should ComReg implement to mitigate potential interference between users using the same spectrum in adjacent geographical areas?

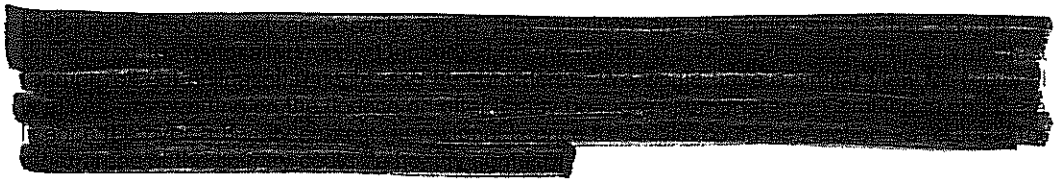
Answer: No comment.

Q. 7. In order to protect current users of the 2.3 GHz band, ComReg proposes that any potential licences offered in the range 2300 – 2330 MHz would be released on the basis of local area or closed user group licences only. Do you agree with this proposal? If not, please give reasons for your answer.

Answer: UPC Ireland agrees with this proposal.

Q. 8. Do you agree with ComReg's proposal that if this spectrum is offered on a national and/or regional basis, it should be by means of an auction or auctions? Do you agree with ComReg's proposal to release any spectrum for local area licensing under a beauty competition? Please supply reasons to support your response.

Answer: As expressed in previous consultations, UPC Ireland believes that awarding licences in any band needs to be cognescent of a number of factors including, the current and future use of the band, the provision of increased competition and innovation, the release plans for other spectrum bands and finally, ensuring a fair economic return is derived for the spectrum.



Q. 9. Do you agree with ComReg's proposal to use benchmarking to assist in setting a fair licence fee for the spectrum? Alternatively, do you believe there is an alternative, superior method of setting the fees? Please supply reasons to support your response.

Answer: To the extent that licences are priced in a manner that is consistent with licence fees applied to licences for other spectrum bands (taking into account all variable factors e.g. propagation value of the spectrum, the business model proposed, whether the applicant is an incumbent or a new entrant etc.), UPC would be in agreement that a benchmark that is applied for this spectrum band.

Q. 10. Do you agree with ComReg's proposal to make licence duration of spectrum in the 2.3 GHz band between 10 - 15 years long? Please supply reasons to support your response.

Answer: Yes we do, a 10 year initial period should be granted with five further years granted provided the licence conditions have been met

Q. 11. Do you agree with ComReg's proposal to limit the amount of spectrum available to any given operator to 30 MHz for a given area? Please supply reasons to support your response.

Answer: [redacted]

Q. 12. Do you agree with ComReg's proposal to attach utility conditions to any potential licences in this band? If not, why? Please provide reasons for your answers.

Answer: (UPC Ireland has no objections to utility conditions being attached to the licence

Q. 13. In your view what would be the most appropriate channel spacing for the 2.3 GHz band? Please give detailed reasons for you answer.

Answer: No Comment

Q. 14. Do you support ComReg's proposed power limit? If not, please set out the reasons for your answer.

Answer: No comment

Q. 15. Do you agree with ComReg's proposal to adapt the Block Edge Mask that applies to the 2500 – 2690 MHz band to the 2.3 GHz band, once a channel bandwidth has been agreed? Please provide reasons to support your response.

Answer: UPC Ireland agrees with the Block Edge Mask.

On a separate note, UPC Ireland notes that the consultation did not include any spectrum band plan and believes that to the extent that one may be available, would request ComReg makes this available to interested parties.

In the event there is none available, we would advocate ComReg draw up such a plan to ensure consistency in approach across this and all spectrum bands.

Q. 16. Do you agree with ComReg's proposal to impose the unwanted emission limits detailed above? Please provide reasons to support your response.

Answer: No comment.

18 UPC Ireland

19 Vodafone

Vodafone Response to the ComReg Consultation on Release of Spectrum in the 2300 – 2400 MHz Band: Proposed Options and Licence Conditions

Ref. ComReg Document 09/49

Response Date: 29 July 2009

Introduction

Vodafone welcomes the opportunity to respond to this ComReg consultation on the release of spectrum in the 2300-2400 MHz band. Our views in relation to ComReg's licensing proposals are set out in detail in response to the consultation questions below.

Response to Consultation Questions

Q.1. ComReg proposes to release spectrum for licensing additional services in the 2.3 GHz band. Do you support ComReg's proposal to release spectrum in the band? Are there other issues, besides those identified above, which ComReg needs to take into account in releasing spectrum in the band? Please give reasons for your answer.

Subject to there being clear evidence of demand for the licensing of additional services in the 2.3 GHz band, and in the context of the considerable amount of spectrum that is currently unallocated to licensed uses and therefore available for release in this band, Vodafone is in agreement with ComReg's proposal.

The economic and social value of the 2.3 GHz frequency band would be enhanced if its use were harmonised across Europe. Vodafone would encourage ComReg to continue its work in the appropriate European and international fora with a view to maximising the prospects for harmonised/co-ordinated use of this spectrum on a pan-European and wider basis.

Q2. Which of the licence types outline above, in your view are the most appropriate for the 2.3 GHz band: national, regional, local or closed user group? Please cite reasons for your answer.

Vodafone considers that national licences are the most appropriate licence type for spectrum to be released in the 2.3 GHz band as these offer the greatest prospects of maximising benefits to end users in terms of mobility and the harnessing of economies of scale to minimise the price of wireless services and associated equipment supplied to customers.

Vodafone agrees with ComReg that given the presence of existing licensees offering other services in certain geographical areas of the country using spectrum in the 2300-230 MHz sub-band, it is neither appropriate nor possible to offer national licences using this part of the 2.3 GHz frequency band. Some combination of local area or closed user group licences could be made available in this sub-band in those geographical areas where the spectrum is not being utilised by either Aervision for the transmission of the Dail TV channel or by eircom for the provision of the Rurtel service.

Vodafone is uncertain as to the prospective benefits of offering regional licences and considers that there could be problematical complexity in the assignment of such licences, including the determination of the appropriate service areas and the possibility that regional licences for some

areas may go unassigned for lack of demand. However any unallocated spectrum as a result of an initial regional licensing allocation process could possibly be re-allocated to local and closed user group licensing where there was demand for this.

The appropriate balance between licence types may best be determined by conducting an appropriate cost-benefit analysis. Any final licensing proposals should ensure that interference and other technical spectrum management issues are fully addressed.

Q3. Do you believe there is a possibility for a combination of all or some of the above in the 2.3 GHz band and, if so, in what way? Please set out your suggested approach.

Yes. National licences could be made available for allocation in the 2330-2400 MHz part of the band with local area and closed user group licences being offered in the 2300-2330 MHz band in those geographical areas where services are not currently being provided by the existing licensees, Aervision for the transmission of the Dail TV channel or by eircom for the provision of the Rurtel service.

Q. 4. If you believe that there should be a combination of licence types in this band, how much spectrum should be allocated to each of the licence types defined in Question 2 ? For example, if you recommend in response to Question 2 that spectrum should be released on a national and regional basis, how much spectrum should be allocated to each licence type? Please give reasons for your answer.

Vodafone considers that prospective benefits for end users may be maximised by releasing most, or all, of the spectrum in the 2330-2400 MHz sub-band for national licences. Spectrum in the 2300-2330 MHz sub-band could be allocated to closed user group or local area licences where there is demand for this, using frequencies, and in those geographic areas, where the existing services licensed in this part of the band are not operating.

Q. 5. If you believe that licences in this band should be offered on a regional basis, on what basis should ComReg determine the regions, eg. provinces, groups of counties? Please support your response as appropriate.

As outlined in the response to question 2, Vodafone does not consider that the issuing of regional licences would be the optimal approach to the licensing of this spectrum.

Q. 6. If you believe Local Area licences to be the superior choice, what geographic area should these licences incorporate and on what basis? (For example, FWALA licences incorporate service area 20 km from defined centre point of licence). What conditions should ComReg implement to mitigate potential interference between users using the same spectrum in adjacent geographical areas.

Q.7. In order to protect current users of the 2.3 GHz band, ComReg proposes that any potential licences offered in the range 2300 – 2330 MHz would be released on the basis of local area or closed user group licences only. Do you agree with this proposal? If not, please give reasons for your answer.

Yes. It is appropriate that the services provided by the existing licensees in the 2300-2330 MHz range are not adversely affected by the licensing of spectrum in this sub-band to other users.

Q. 8. Do you agree with ComReg's proposal that if this spectrum is offered on a national and/or regional basis, it should be by means of an auction or auctions? Do you agree with ComReg's proposal to release any spectrum for local area licensing under a beauty competition? Please supply reasons to support your response.

Vodafone agrees that it would be appropriate that spectrum in the 2330-2400 MHz band offered on the basis of national licences should be allocated by means of an auction. This is the case as this spectrum is not currently licensed to other users and therefore there is no issue of an impact on services provided by any existing licensees.

Q. 9. Do you agree with ComReg's proposal to use benchmarking to assist in setting a fair licence fee for the spectrum? Alternatively, do you believe there is an alternative, superior method of setting the fees? Please supply reasons to support your response.

Vodafone believes that carrying out a robust economic analysis to determine the opportunity cost of spectrum in the band would in principle be the optimal approach.

Q. 10. Do you agree with ComReg's proposal to make licence duration of spectrum in the 2.3 GHz band between 10-15 years long? Please supply reasons to support your response.

The duration of national licences in the 2.3 GHz band should be broadly in line with the duration of national licences in spectrum bands that are comparable in terms of their potential uses and propagation characteristics. Vodafone considers that a licence duration of 15 years, with a potential option for further extension, would be optimal.

Q. 11. Do you agree with ComReg's proposal to limit the amount of spectrum available to any given operator to 30 MHz for a given area? Please supply reasons to support your response.

Vodafone agrees that a spectrum cap of 30 MHz for any given area as proposed would be a reasonable measure to facilitate, for reasons of promotion of competition, direct access to the 2.3 GHz spectrum band by more than one licensee.

Q.12. Do you agree with ComReg's proposal to attach utility conditions to any potential licences in this band? If not, why? Please supply reasons to support your response.

Yes. Vodafone agrees that it is appropriate that conditions regarding rollout and coverage should be attached to licences offered in the 2.3 GHz band and that elements such as performance bonds, and provisions allowing ComReg to restrict or revoke licences where the licensee does not adhere to the conditions of the licence should be available to ensure efficient use of the spectrum.

Q. 13. In your view what would be the most appropriate channel spacing for the 2.3 GHz band? Please give detailed reasons for your answer.

Spectrum block sizes should be consistent with ensuring the efficient provision of services using the most likely candidate technologies (such as WiMax and LTE) and, to the fullest extent practicable, should be determined so as not to effectively discriminate against any potential technology that could be deployed in this band.

Q. 14. Do you support ComReg's proposed power limit? If not, please set out the reasons for your answer.

Q. 15. Do you agree with ComReg's proposal to adapt the Block Edge Mask that applies to the 2500 – 2690 MHz band to the 2.3 GHz band once a channel bandwidth has been agreed.? Please provide reasons to support your response.

Yes. This proposed approach appears to be reasonable.

Q. 16. Do you agree with ComReg's proposal to impose the unwanted emission limits detailed above? Please provide reasons to support your response.

Yes. This proposed approach appears to be reasonable.

20 WiMAX Forum

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WiMAX Forum® starts validation early for 2.3 GHz mobile certification profile

13 companies submit equipment for validation testing process

PORTLAND, Ore. – July 23, 2009 - The WiMAX Forum® today announced that validation testing for the 2.3 GHz Mobile WiMAX™ profile in the 5/10 MHz and 8.75 MHz channels has begun and expects the first group of 2.3 GHz products to be WiMAX Forum Certified™ in 4Q 2009.

"The acceleration of the certification of 2.3GHz WiMAX products demonstrates the WiMAX Forum's unwavering commitment to effective certification programs for the ecosystem," said Dr. Mohammad Shakouri, acting president of WiMAX Forum. "The WiMAX Forum's goal is to create an ecosystem that is supported by interoperable products. Our progress in certification of 2.3GHz also shows the market demand and potential for this spectrum band."

2.3GHz WiMAX operators are amongst the fastest growing sectors in WiMAX ecosystem. Globally, the WiMAX Forum has tracked 29 commercial deployments in this spectrum band as of June 2009.

"The certification of 2.3 GHz products is critical to the deployment of WiMAX networks in regions such as India, Asia and Africa," said Ed Agis, co-chair of the WiMAX Forum Certification Working Group. "Certification profiles for 2.3 GHz also pave the way for WiMAX Forum Certified tri-band devices in 2010 which will increase the opportunities for true global roaming across networks in the 2.3, 2.5 and 3.5 GHz spectrum bands which make up a global WiMAX footprint today."

Currently, 13 WiMAX Forum member companies have submitted subscriber station and/or base station equipment to be part of the validation testing pool. With such a promising turnout from the vendor community, the WiMAX Forum sees the potential of multiple different form factors in this profile using WiMAX devices to enter the marketplace by early 2010. Mobile WiMAX

operators like Korea Telecom and Packet One are amongst the most active operators engaging with the WiMAX Forum for the 2.3 GHz validation process, providing over-site to the test cases and adding their networking expertise to optimize the tests for their networks.

"We are encouraged by how rapid this validation process has become thanks to best practices and knowledge gained from previous validation and certification processes," said Agis. "At the start of the certification program, it took about nine months to get the first batch of test cases complete. Now it only takes two to three months to validate the test cases before we start certifying devices."

The WiMAX Forum is the worldwide consortium focused on global adoption of WiMAX and chartered to establish certification processes that achieve interoperability, publish technical specifications based on recognized standards, promote the technology and pursue a favorable regulatory environment. The WiMAX Forum's membership base represents a thriving WiMAX ecosystem that supports more than 484 WiMAX network deployments in 141 countries.

For more information on the WiMAX ecosystem, please visit www.WiMAXTimes.com.

About the WiMAX Forum®

The WiMAX Forum® is an industry-led, not-for-profit organization formed to certify and promote the compatibility and interoperability of broadband wireless products based upon the harmonized IEEE 802.16e/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, nomadic, 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. Through the WiMAX Forum Congress Events Series of global trade shows and events, the WiMAX Forum is committed to furthering education, training and collaboration to expand the reach of the WiMAX ecosystem. For more information, visit the trade show link at www.wimaxforum.org.

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