

ERICSSON RESPONSE TO THE OFCOM “AWARD OF AVAILABLE SPECTRUM 2500-2690MHZ, 2010-2025MHZ AND 2290-2300MHZ” CONSULTATION

1. Introduction

Ericsson welcomes the opportunity to respond to this consultation. Ericsson supports and welcomes the release of additional spectrum which can support valuable services.

Ericsson has previously explained why we feel that the Ofcom policy of spectrum liberalisation is misguided, in not being optimal, either from the consumer or the industry viewpoint.

In particular Ericsson wishes to highlight the following concerns with some of the proposals outlined in this consultation.

Ericsson believes that departure from the CEPT band plan would be misguided and could lead to the UK being disadvantaged in terms of harmonised European-wide services and the resulting benefits of economies of scale in infrastructure and terminals.

Ericsson considers that allowing the market at one particular time to set the relative mix of paired and unpaired spectrum is misguided because of the essentially asymmetrical characteristics between future conversion from paired to unpaired and unpaired to paired spectrum and also because of the potential for departure from the CEPT band plan as discussed above. Also any significant departure from the CEPT band plan in the form of more unpaired TDD bands, would increase the number of bands with heavy “guard band” restrictions and resulting inefficiency in the use of valuable resource.

Ericsson considers that a move away from the current proven approach to interference control based on reference to international standards and agreements, towards the unproven concepts of either derived spectrum masks or spectrum users’ rights, would be misguided. Control of interference and successful coexistence of different technologies and services is best achieved by reference to standards produced by the appropriate internationally recognised standards bodies and also by references to Recommendations and Decisions of CEPT/ECC and ITU. This approach ensures that spectrum use is harmonized on both sides of geographic boundaries, and that different systems are standardised and carefully assessed against each other from a coexistence point of view.

Particular spectrum bands should only be used for products conforming to the appropriate European Harmonised Standards applicable for that spectrum band. The process to produce such standards is first to write a systems reference document (SRD) in ETSI, to forward that SRD to CEPT/ECC where compatibility studies can be carried out to ensure that there will be no problems if it is used in the proposed and specified spectrum bands then to incorporate the agreed limits in the ETSI draft harmonized standard.

In the light of Ofcom’s aim of reducing regulatory uncertainty, it is somewhat surprising that it is proposed to auction spectrum which is generally regarded by the industry as 3G expansion, whilst the issue of “re-farming” 2G spectrum in the UK is not resolved.

Also Ericsson notes that there does not seem to be any provision being made to identify suitable spectrum for low power 3G services to provide an evolution path for the recently auctioned low power 2G licences.

2. Answers to Specific Questions

Question 1: Do you agree with these proposals for the awards of the three bands or have any other comments on the contents of this document?

Ericsson generally supports the release of additional spectrum which can support valuable services such as public mobile communication networks using standardized IMT-2000 and IMT-Advanced technologies.

Question 2: Do you agree with the analysis in section 5 or have any comments on adjacent interference issues?

The analysis of use in the bands and adjacent bands is quite good and mostly complete. However, the text on international allocation and uses in 5.14-5.18 should be more closely linked to the very informative text on existing European spectrum decisions that is outlined in detail in 4.23-4.35.

These decisions may to a large extent not be implemented today, but they will certainly have impact on the use of the spectrum throughout Europe at the time of deployment in these bands, if not at the time of the awards.

The impact is not only a question of possible interference issues, but also of *roaming*. The ability to roam with mobile devices is of high commercial interest, but may become very limited in a country that implements a diverging spectrum arrangement.

Question 3: Do you agree that Ofcom should authorise use of the spectrum bands 2500-2690 MHz, 2010-2025 MHz and 2290-2300 MHz?

Ericsson generally supports the release of additional spectrum which can support valuable services such as public mobile communication networks using standardized IMT-2000 and IMT-Advanced technologies.

Question 4: Do you agree that awarding licences by auction would be the appropriate mechanism for authorising use of the spectrum bands 2500-2690 MHz, 2010-2025 MHz and 2290-2300 MHz?

No comment.

Question 5: Do you agree that it is likely to be in the interests of citizens and consumers to proceed with the award of the 2.6 GHz and 2010 MHz bands as soon as practicable, rather than to delay the award pending reduction in uncertainty relating to other bands?

Ericsson generally supports the release of additional spectrum which can support valuable services, although, considering Ofcom's aim of reducing regulatory uncertainty, it is somewhat surprising that it is proposed to auction spectrum which is generally regarded by the industry as 3G expansion, whilst the issue of "re-farming" 2G spectrum in the UK is not resolved.

Question 6: Do you agree Ofcom should aim to award the bands 2500-2690 MHz, 2010-2025 MHz and 2290-2302 MHz by the end of 2007, while keeping the position on the 2.6 GHz and 2010 MHz bands under review in the light of possible developments in European regulatory fora?

Ericsson believes that European harmonization should be an overriding concern. Ericsson supports Ofcom's proposal to keep the position on the 2.6GHz and 2010MHz bands under review in the light of possible developments in Europe even if this results in a delay to the awards in the interests of a pan-European harmonized approach which will deliver the greatest benefits to consumers and to industry.

Question 7: Do you agree with Ofcom's proposals for licence conditions (technology neutrality, tradability, conditions of tenure and absence of roll-out obligations)?

Ericsson on the whole concurs with the objectives of efficient spectrum use and of increased flexibility in new spectrum management practices.

At the same time, some caution is called for when new measures are proposed. We would like to recall some of the basic characteristics that have led to the emergence of spectrum as a valuable commercial resource, particularly over the last fifteen years, where GSM and UMTS/IMT-2000 public mobile communications have contributed significantly to positive improvements of the socio-economical situation within the Europe.

A recent study by Booz-Allen-Hamilton ("Thriving in Harmony" October 2006) shows that an indiscriminate pursuit of the objective of flexibility would reduce consumer's benefits from wide area roaming systems of the GSM and UMTS/IMT-2000 types.

Question 8: Do you have views on whether or not there should be a "safeguard" cap on the amount of spectrum that any one bidder could win in an award for the 2.6 GHz bands and, if so, do you have a view on whether 90 MHz would be an appropriate size for a safeguard cap?

No comment

Question 9: Do you agree with Ofcom's proposal to package spectrum as lots of 2 x 5 MHz for paired use and 5 MHz lots for unpaired spectrum and to allow the aggregation of lots by bidders?

Ericsson agrees with Ofcom's proposal to package spectrum as lots of 2 x 5 MHz for paired use and 5 MHz lots for unpaired spectrum, with the exception of the 2010 band where pairing with 2.6GHz should be an option

Question 10: Do you agree with Ofcom's proposed approach to allowing the respective amounts of paired to unpaired spectrum for the band 2500-2690 MHz to be varied (maintaining the 120 MHz duplex spacing and allowing additional unpaired spectrum, if needed, at the top end of the band)?

The proposed variability causes many problems. The Mason study demonstrates some of the problems, although it fails to reach firm conclusions.

Some doubt has been raised questioning if there really will be a harmonised use of the 2.6 GHz band in Europe. There are five countries that have implemented ECC Dec 05(05) today and another three are committed, including France. A diverging UK arrangement will certainly work against harmonisation.

For Base Stations it is possible to add specific filters to adapt to a diverging UK spectrum arrangement. But extra filters are costly, especially if the guard band is small. The Base Stations have to be tailored to the UK market and also to a specific operator which has an additional cost impact.

The Mason report points out that mitigation with filters is not realistic for user equipments. With a diverging arrangement in the UK, user equipments designed for the harmonised European FDD/TDD arrangement will have problems operating in the UK. This forces UK operators to acquire special UK-tailored more expensive mobiles. It cannot be assumed that the industry will necessarily develop such terminals. It will also make roaming within Europe difficult if not impossible in this band.

As an example, the FDD and TDD specs for UMTS were specifically tailored to ECC Dec 05(05), as 3GPP was instructed to do so by the ECC. A large amount of work was put into spurious emissions and blocking requirements that provide sufficient isolation between FDD and TDD operation. Successful operation under these requirements can only be guaranteed in a spectrum allocation as in ECC Dec 05(05). Specifically, there will be problems with spurious emissions in mobile-to-mobile scenarios if the FDD/TDD split is done in a diverging way. This will especially disadvantage FDD operation.

Because of the variable FDD/TDD split, there will be uncertainty on the part of potential bidders for FDD spectrum as to whether efficient operation in that spectrum will be possible. This uncertainty will most certainly decrease the value of the spectrum.

Question 11: Do you agree with Ofcom's proposals for a 5 MHz restricted block between FDD and TDD neighbours and between TDD and TDD neighbours and with a modified out-of-band base station mask for second adjacent 5 MHz blocks?

A guard band will be needed between FDD and TDD blocks, but 5 MHz "restricted" block between FDD and TDD will not be sufficient – see the response to Question 10. The proposal seems to be based on the Mason study, but that report is not conclusive and actually recommends a 15 MHz separation (=10 MHz guard).

Regarding the Mason study, some comments are needed that relate to the whole layout of the proposed Ofcom award scheme for 2.6 GHz:

- System parameters in the Mason study are partly based on an ITU-R WP8F "TEMP" document which has been under heavy debate for almost two years, since those parameters are considered highly unrealistic.
- The Mason study shows severe problems for BS-to-BS co-existence with a 5 MHz "guard". The study indicates that the problems solved by mitigation techniques taken from ITU studies. Also these techniques are heavily questioned in the ongoing ITU-R

discussions. The ones assumed by the Mason report range from the quite unrealistic 60 dB BS filters, to the mostly impossible “antenna azimuth” gain.

- The Mason study also shows severe mobile-to-mobile interference at 10 m distance. This problem is dismissed with a brief discussion in Appendix A, based on a list of assumptions for how the services are used – a few modifications to these quite arbitrary assumptions will completely change the conclusion.
- The Mason study does in the end actually conclude (Appendix A) that at least 15 MHz separation is needed between FDD and TDD (equivalent to a 10 MHz “guard”), but even this will require “suitable mitigation”. The proposed award scheme using a flexible allocation and a limited 5 MHz “restricted” block takes no regard of the severe problems concluded in the Mason study.
- All analysis is based on UMTS and/or WiMAX with 5 MHz RF bandwidth and no consideration is given to systems with other RF bandwidths (e.g. 3G LTE with 20MHz).

Question 12: Do you agree with Ofcom’s proposals to award the 2010 MHz band as a single 15 MHz lot?

Ericsson agrees with this proposal and notes that the Ofcom analysis and the implications concluded in 5.55 are based on ERC Report 65, which is the basis for the 3G spectrum licensing in that band. There should be the option of pairing this band with spectrum from the “centre” of the 2.6GHz band.

Question 13: Do you agree with Ofcom’s proposals to award the 2290 MHz band as a single 10 MHz lot?

Ericsson agrees with this proposal.

Question 14: Do you agree with Ofcom’s proposals to combine the award of the 2.6 GHz and 2010 MHz bands and to hold the award of the 2290 MHz band separately and in advance?

Ericsson agrees with the proposal to combine the award of 2.6 GHz and 2010 MHz band since it opens up possibilities to pair the 2010-2025 band the with 2.6MHz centre block. This pairing is currently being standardised for UMTS within ETSI. The auction process and technical conditions should give the option of deployment of FDD technology on such paired spectrum.

Ericsson agrees that the 2290MHz band should be awarded separately as it has no connection with the other bands and is not harmonised.

Question 15: Do you agree with Ofcom’s proposals for a two-stage auction design for the 2.6 GHz and 2010 MHz bands?

No comment.

Question 16: Do you agree with Ofcom proposals to award the 2290 MHz band through a second price sealed bid auction?

No comment.

Question 17: Do you have a preference for either of the two approaches to specifying technical licence conditions?

Ericsson considers that a move away from the current proven approach to interference control based on reference to international standards and agreements, towards the unproven concepts of either derived spectrum masks or spectrum users' rights, would be misguided.

Control of interference and successful coexistence of different technologies and services is best achieved by reference to standards produced by the appropriate internationally recognised standards bodies and also by references to Recommendations and Decisions of CEPT/ECC and ITU.

This approach ensures that spectrum use is harmonized on both sides of geographic boundaries, and that different systems are standardised and carefully assessed against each other from a coexistence point of view.

In addition to the above general comments, there are several specific areas of the proposals which are unclear:

- Conditions are largely based on current UMTS and WiMAX parameters. It is unclear how evolution of those technologies will be taken into account, particularly considering the current work on 3G LTE and the recently initiated work on IEEE 802.16m.
- In what way does the award scheme ensure that new technologies through innovation and evolution can operate in the bands?

Question 18: Do you have any comments on the transmitter spectrum masks defined below?

Ericsson considers that a move away from the current proven approach to interference control based on reference to international standards and agreements, towards the unproven concepts of either derived spectrum masks or spectrum users' rights, would be misguided. Control of interference and successful coexistence of different technologies and services is best achieved by reference to standards produced by the appropriate internationally recognised standards bodies and also by references to Recommendations and Decisions of CEPT/ECC and ITU. This approach ensures that spectrum use is harmonized on both sides of geographic boundaries, and that different systems are standardised and carefully assessed against each other from a coexistence point of view.

The general problem is that the masks will not be sufficient, since 5 MHz "guard" or "restricted block" will not be sufficient as is shown in the Mason study. Since the masks do not provide sufficient protection, considerable additional mitigation will still be needed. At the same time, the mask levels for the base station are at some points (at 2nd adjacent channel) 26 dB stricter than the 3GPP specifications, thereby adding considerable complexity without fundamentally solving the co-existence problem.

There is a reference in 9.3 to 3GPP specs for the masks, but it is very difficult to derive the exact numbers since no *specific* references are made.

Question 19: Do you have any comments on the SURR parameters defined below?

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Question 20: Do you have any comments on the SUR methodology and assumptions detailed in this annex?

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Question 21: Do you have any comments on the use of the Visualyse tool as described, on the assumptions or the propagation model proposed in this annex?

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Question 22: Do you have any comments on the assumptions detailed in this annex?

Ericsson considers that a move away from the current proven approach to interference control based on reference to international standards and agreements, towards the unproven concepts of either derived spectrum masks or spectrum users' rights, would be misguided. Control of interference and successful coexistence of different technologies and services is best achieved by reference to standards produced by the appropriate internationally recognised standards bodies and also by references to Recommendations and Decisions of CEPT/ECC and ITU. This approach ensures that spectrum use is harmonized on both sides of geographic boundaries, and that different systems are standardised and carefully assessed against each other from a coexistence point of view.