

Digital dividend: cognitive access

T-Mobile welcomes the opportunity to respond to Ofcom's consultation, "Digital dividend: cognitive access". The analysis in this consultation applies to the interleaved spectrum below 790 MHz. We would be very concerned if this work was used for other bands with services having different characteristics. A separate analysis and consultation would be required before cognitive access is to be allowed in other bands.

In Ofcom's statement of 28 June 2005 on the Spectrum Framework Review (SFR), Ofcom noted the potential of cognitive devices to cause harmful interference or reduce flexibility to change the use of spectrum. Ofcom suggested that they should only be allowed to use spectrum with the agreement of the licence holder. T-Mobile strongly supports this suggestion and would have severe concerns otherwise.

We have limited our response to Question 1 although many of our comments apply to other questions.

<p><i>Question 1. The executive summary sets out our proposals for licence-exempting cognitive devices using interleaved spectrum. Do you agree with these proposals?</i></p>

General comments

T-Mobile believes that this consultation is a good starting point for discussions within CEPT and ETSI. However we do have concerns that it is far too early to agree the detailed technical conditions suggested in the consultation and we have doubts that these will protect the other users of the radio spectrum. The consultation states that:

"In its report of 12 February 2007,¹¹ QinetiQ concluded that fully functional cognitive radios were perhaps 10-20 years from realisation and that, at that time, there did not appear to be any applications for which a business case could be made to justify their introduction."

Given this estimated late timescale, we do not see the urgency to define the technical conditions for cognitive radios and would recommend Ofcom to work with stakeholders and within CEPT, ETSI before making any final decisions. However we would encourage further research, measurements, trials and practical studies.

Cognitive radio may be of use for countries having large areas of unused 'white spaces'. However for countries such as the UK where there are limited areas which are not used by either DVB-T or PMSE, we find it difficult to see a real commercial possibility of using cognitive radio.

Ofcom's analysis assumes that a cognitive device will be portable however fixed devices are also possible. It is also unclear whether the analysis takes into account the

fact that multiple devices could be transmitting in an area at the same time which could result in interference.

We note that the use of GPS can not be relied upon to determine the location of a cognitive device in all cases such as in-buildings and in dense high rise areas.

Harmful interference and related issues

This consultation states in 1.8 that:

‘While it is not possible to set parameters such that harmful interference will never occur, it is possible to set them such that there is an acceptably low probability of harmful interference.’

This is clearly contrary to the Ofcom statement of 13th December 2007 on the approach to awarding the digital Dividend, where Ofcom stated that cognitive access should be allowed as long as it would not cause harmful interference to licensed uses, including DTT and programme-making and special events (PMSE).

T-Mobile believes that detailed and comprehensive testing would be needed to confirm that harmful interference is not experienced and, moreover, any “harmful interference” in this context needs a very careful definition. Unless there is a clear understanding what “harmful interference” means, it is not appropriate to agree on absolute transmitter limits for cognitive access.

Ofcom suggests cognitive access type-approval verification under the R&TTE Directive to determine whether devices are likely to cause harmful interference. Again, this can only be done in a reasonable way, if a detailed definition of “harmful interference” is provided.

Future modification of Cognitive Access parameters

The consultation states in 2.11 that:

It is generally not possible to design a cognitive device to be able to detect and avoid every technology that might be deployed in the spectrum in the future. Hence, there is a risk that cognitive access to interleaved spectrum might reduce the value of subsequently deploying different technologies. If it became clear in due course that a valuable new licensed use could not be deployed as a result of cognitive access, we would review the situation and determine whether to modify the parameters relating to cognitive devices.

We do not quite understand how Ofcom could practically modify the parameters at a later date once cognitive systems had already been deployed. We are therefore

concerned that allowing cognitive access will limit future possibilities for this spectrum.

Cognitive access in other bands

The analysis in this consultation applies to the interleaved spectrum below 790 MHz. We would be very concerned if this work was used for other bands with services having different characteristics. A separate analysis and consultation would be required before cognitive radio was allowed in other bands.

In Ofcom's statement of 28 June 2005 on the Spectrum Framework Review (SFR), Ofcom noted the potential of cognitive devices to cause harmful interference or reduce flexibility to change the use of spectrum. Ofcom suggested that they should only be allowed to use spectrum with the agreement of the licence holder. T-Mobile strongly supports this suggestion and would have severe concerns otherwise.

DTT equipment receiver performance

T-Mobile agrees that while it is not appropriate to expect consumers to replace DTT equipment purely to avoid cognitive interference, there is merit in progressively expecting better receiver performance from manufacturers such that over time, the installed base becomes more spectrum efficient. To achieve this, the relevant standards such as EN 55020 should be modified. The R&TTE Directive could be amended to include receiver parameters for spectrum efficiency reasons. Finally Ofcom could consider the use of Interface requirements to specify receiver parameters for DTT equipment.

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