

# Consultation on Digital Dividend Review – Microsoft Comments

## Executive Summary

### Overview

Microsoft welcomes the Digital Dividend Review (DDR) and is a strong supporter of Ofcom's emphasis on technology and service neutrality in the management of spectrum.

However, the consultation document appears too bipolar in its presentation and development of strategic options for management of the Dividend. The fundamental choice is presented as being between a "market-led" approach and an "interventionist" approach. We prefer the approach adopted in Ofcom's earlier Spectrum Framework Review, which acknowledged three fundamental strategies - "command and control", "market mechanisms" and "licence-exempt".

The issue here concerns the licence-exempt use of spectrum. In the DDR consultation, licence-exemption is considered as a regulatory intervention, and therefore has to be justified on the basis of detailed evidential analysis just as if it were an intervention to restrict spectrum licences to a specific use. Benefits of licence-exemption include flexibility for innovation and ad-hoc deployment by small entities. Experience with WiFi (and other licence-exempt innovations before it) has shown these to be substantial, but they are difficult to quantify within Ofcom's current framework for justifying intervention.

Against the wider background of electronic communications regulatory reform, it could be argued that it is licensing (rather than licence-exemption) that is the intervention that needs to be justified. Licence-exemption can be seen as the ultimate market-liberating approach.

The consultation is also almost silent on the substantial potential for licence-exempt use of the interleaved channels (also known as "vacant channels" or "white spaces"). This is an area of very active work in the US and the potential in the UK and elsewhere in Europe is similar. The FCC issued last October its First Report and Order and Further Notice of Proposed Rulemaking concerning Unlicensed Operation in the TV Broadcast Bands<sup>1</sup>. This confirms the FCC's commitment to allow such operation, and sets out a schedule with laboratory and field test results to be published in July 2007, a second report and order specifying final requirements for devices operating in the TV bands in the autumn of 2007, and equipment to be permitted for retail sale from February 2009.

Microsoft has joined with Dell, Google, HP, Intel and Philips to submit detailed comments<sup>2</sup> in response to this FCC document. Ofcom should consider these alongside this response. Most of the comments are equally relevant to the UK situation.

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<sup>1</sup> [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/FCC-06-156A1.doc](http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-06-156A1.doc)

<sup>2</sup> Comments at [http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native\\_or\\_pdf=pdf&id\\_document=6518724310](http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6518724310)

Reply comments at [http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native\\_or\\_pdf=pdf&id\\_document=6518909731](http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6518909731)

## **Specific Proposals**

Against this background, we set out in our detailed response the following main proposals:

1. Ofcom should permit licence-exempt operation in the interleaved channels. This will allow a vast increase in spectrum utilisation. Use of this spectrum will unleash a new generation of super wireless broadband devices that will enable offerings such as: (a) wireless broadband service in rural areas to be delivered more cost effectively; (b) self-forming mesh networks in cities and suburbs capable of routing traffic at broadband speeds within the mesh, and (c) innovative applications that have not yet been invented.
2. The bulk of the Digital Dividend cleared spectrum should be auctioned on a technology-neutral basis, but an Innovation Reserve of, say, three cleared channels should be held back for potential designation as licence-exempt, pending market developments with unlicensed operation in TV bands in the US and further consideration in the European Commission and Parliament of innovation via licence exemption. Ofcom should review the position in two years.

Licence exempt use of some of the Digital Dividend in this way will deliver tremendous benefits to consumers and spur many innovations.

## **Responses to the Specific Consultation Questions**

*Question 1: This executive summary sets out Ofcom's proposals for the release of the digital dividend. Do you agree with these proposals?*

We agree with the emphasis on service and technology neutrality and with the proposal for auctions for most of the Digital Dividend clear spectrum.

However, licence-exemption is presented as a regulatory intervention with a high threshold of justification, rather than as an alternative approach to delivering a flexible outcome allowing market innovation. Consequently the Executive Summary is not entirely self-consistent: It leaves the door open conceptually to licence-exemption for low-power devices - recognising some benefits, saying that further evidence will be gathered during the consultation and inviting comments on holding back spectrum as an "innovation reserve" - but goes on to discuss detailed auction packaging options which appear to preclude this option. Furthermore the potential for the operation of low power licence-exempt devices in the interleaved channels is substantially underemphasised.

The Foreword appears to adopt a more open approach, highlighting the key point that the regulator cannot know the best uses of the Digital Dividend over the next couple of decades, but can create a framework that is more (or less) likely to enable those uses. This framework needs to recognise the position of licence exemption as a valid strategic alternative to "command and control" or "market mechanisms" (as in Ofcom's earlier Spectrum Framework Review) for achieving the desired flexibility.

*Question 2: Do you have any comments on our analysis of the essential constraints that will apply to the available UHF spectrum?*

This analysis makes passing reference to the potential for low-power devices other than radio-microphones to use interleaved channels, but does not acknowledge the large body of work in the US on this issue. For example the FCC issued last October its First Report and Order and Further Notice of Proposed Rulemaking concerning Unlicensed Operation in the TV Broadcast Bands<sup>3</sup>. This confirms the FCC's commitment to allow such operation, and sets out a schedule with laboratory and field test results to be published in July 2007, a second report and order specifying final requirements for devices operating in the TV bands in the autumn of 2007, and equipment to be permitted for retail sale from February 2009. This work is equally relevant to the situation in the UK and elsewhere in Europe, and should be taken into account by Ofcom. We would also direct Ofcom to the detailed comments<sup>4</sup> filed by Dell, Google, HP, Intel, Microsoft and Philips North America ("the Coalition") in response to this Report and Order, and also to a thorough engineering study<sup>5</sup> showing how licence-exempt low-power devices can co-exist with Digital TV through the use of cognitive radio techniques. Microsoft has submitted to the FCC a prototype device

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<sup>3</sup> [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/FCC-06-156A1.doc](http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-06-156A1.doc)

<sup>4</sup> Comments at [http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native\\_or\\_pdf=pdf&id\\_document=6518724310](http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6518724310)

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<sup>5</sup> [http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native\\_or\\_pdf=pdf&id\\_document=6518724362](http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6518724362)

for thorough testing and evaluation, which will demonstrate the effectiveness of practical cognitive radio techniques.

Also, in the “constraints” section the DDR consultation acknowledges (para 3.20) the European Framework requirement not to make the use of radio frequencies subject to individual licensing where possible, but goes on in the rest of the document to presume licensing as the base case against which any departure needs to be thoroughly justified.

*Question 3: Do you agree with the more detailed analysis and proposals regarding these technical constraints as set out in Annex 10?*

This annex presents an excellent and substantial body of technical work, but omits the key area of co-existence between broadcasting and low-power licence-exempt applications (other than radio-microphones). There is passing reference to the fixed access work in the IEEE 802.22 group, but even this is underplayed by emphasising the “challenges involved in specifying a robust cognitive radio system”. There is no reference to the substantial FCC process for allowing unlicensed device operation (including personal / portable uses) in the TV bands or to the laboratory and field tests being carried out as part of this. This is a major omission that needs to be rectified. Please see the documents referred to above in our response to question 2.

*Question 4: Do you have any comments on Ofcom’s assessment of the potential uses of this spectrum? Are there any potential uses which should be considered that are not mentioned in this document?*

The assessment of Low-power applications is unnecessarily pessimistic and is coloured by two major limitations of the consultation document.

First, licence-exempt low-power uses are grouped with other uses potentially to be pre-determined by regulatory intervention and are subjected to an economic analysis which is not fit for purpose. The economic modelling presumes that uses are well-specified and amenable to quantification of consumer benefits and opportunity costs. But the proposal with licence-exempt spectrum use is not to pre-determine one specific quantifiable application, but to allow for innovation and a wide-range of potential applications. In the case of WiFi at 2.4GHz, it was good fortune (or perhaps forward-looking regulation) that there was a usable band set aside for Industrial, Scientific and Medical applications available for licence-exempt operation. If at that time the same economic hurdles as are being applied in this consultation by Ofcom had been in place, it is unlikely that this multi-billion dollar industry with at last count over a billion devices in use would ever have got off the ground<sup>6</sup>. Licence-exemption needs be considered as a separate part of the framework, not as one of the list of potential regulatory interventions.

Secondly, the lack of acknowledgement of the potential for licence-exempt use of the interleaved channels means that the analysis casts doubt on whether there could ever be enough spectrum available to meet potential demand by licence-exempt low power

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<sup>6</sup> The same is probably true for other licence-exempt applications such as remote control toys, wireless key fobs, cordless phones etc. Licence-exemption has along history of fostering innovation.

devices. But the suggestion is not that three licence-exempt cleared channels alone would meet all the potential demand, but that this should be combined with the licence-exempt use of interleaved channels.

*Question 5: Do you have any comments on our analysis of the choice between a market-led and an interventionist approach to the release of this spectrum? Do you agree with the analysis of different mechanisms for intervening to remedy potential market failures?*

The analysis is too bipolar in setting out the fundamental choice between a “market-led” approach and an “interventionist” approach. We prefer the approach adopted in Ofcom’s earlier Spectrum Framework Review, which acknowledged three fundamental strategies - “command and control”, “market mechanisms” and “licence-exempt”.

The issue here concerns the licence-exempt use of spectrum. In the DDR consultation, licence-exemption is considered as a regulatory intervention, and therefore has to be justified on the basis of detailed evidential analysis just as if it were an intervention to restrict spectrum licences to a specific use. Benefits of licence-exemption include flexibility for innovation and ad-hoc deployment by small entities. Experience with WiFi has shown these to be substantial, but they are difficult to quantify within Ofcom’s current framework for justifying intervention.

Against the wider background of electronic communications regulatory reform, it could be argued that it is licensing (rather than licence-exemption) that is the intervention that needs to be justified. Licence-exemption can be seen as the ultimate market-liberating approach.

*Question 6: Do you agree with our proposals to continue making available channel 69 for use by low power PMSE devices? Do you agree with our proposal to make some or all of the spectrum available for use on a licence-exempt basis?*

The case for licence-exempt PMSE use of channel 69 is made here on primarily pragmatic grounds, given the current situation on the ground with radio-microphones. We have no reason to disagree with this analysis, but would call for a more rounded approach to licence-exemption, recognising its position as a valid third spectrum strategy alongside command and control and market mechanisms.

*Question 7: Do you agree that there should be transitional protection for professional PMSE users to ensure that they can continue to access interleaved capacity until at least the end of 2012? Do you have any views on the mechanism for providing future access to this spectrum?*

We acknowledge the case for some limited transitional protection, but do not support licensed use in the interleaved channels on a long-term basis.

*Question 8: Do you consider that additional spectrum from the digital dividend should be reserved for low power applications? If so, please provide as much evidence as possible about the nature of the application and its potential value to society.*

Ofcom should permit licence-exempt operation in the interleaved channels. This will allow a vast increase in spectrum utilisation. Use of this spectrum will unleash a new generation of super wireless broadband devices that will enable offerings such as: (a) wireless broadband service in rural areas to be delivered more cost effectively; (b) self-forming mesh networks in cities and suburbs capable of routing traffic at broadband speeds within the mesh, and (c) innovative applications that have not yet been invented. For more details on this proposal, see the comments submitted to the FCC by Dell, Google, HP, Intel, Microsoft and Philips North America referenced in the response to question 2 above.

The UHF spectrum will allow low power (100mW) wireless signals to travel farther and more easily through obstacles than spectrum currently being used for wireless broadband devices. For example, a signal sent using Digital Dividend spectrum will travel 2-3 times further than one sent at 2.4 GHz, leading to lower capital costs for municipal networks, and allowing inter-home mesh networking (which isn't possible at low power using the 2.4 GHz spectrum).

*Question 9: Do you consider that it would be desirable to hold back some spectrum from award with a view to its potential use for future innovation? If so, please provide comments on how much spectrum should be held back, and for how long*

In addition to permitting licence-exempt operation in the interleaved channels, Ofcom should hold back an Innovation Reserve of, say, three cleared channels for potential designation as licence-exempt, pending market developments with unlicensed operation in TV bands in the US and further consideration in the European Commission and Parliament of innovation via licence exemption.

As noted earlier in this response, there is substantial activity in the US which is likely to result in more solid evidence of the practicability of the co-existence between low power licence-exempt devices and digital TV (and also radio microphones) becoming available in the next few months. As a result of this work it may well emerge that an optimum spectrum package is to have available both interleaved channels sharing on a geographic basis with Digital TV, and a small number of cleared channels available nationally.

There is also substantial debate within the European Parliament and Commission on spectrum policy, which recognises the benefits of unlicensed, or licence-exempt, allocation (see, for example the February 2007 European Parliament resolution "Towards a European policy on the radio spectrum"<sup>7</sup>).

Now would not be the time to foreclose all possibility of making available some of the cleared channels of the Digital Dividend for licence-exempt applications. The digital TV switchover is a once-in-a-lifetime opportunity for reconsideration of such a substantial block of prime spectrum. Ofcom should review the position in two years' time.

However, there is no need to hold back all the Digital Dividend clear spectrum in this way, since the best balance is probably to have a majority of licensed spectrum and a

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<sup>7</sup> [http://ec.europa.eu/information\\_society/policy/radio\\_spectrum/docs/ep\\_dr\\_res\\_spectrum\\_14\\_02.pdf](http://ec.europa.eu/information_society/policy/radio_spectrum/docs/ep_dr_res_spectrum_14_02.pdf)

minority of licence-exempt in each major band<sup>8</sup>. Licence-exempt spectrum is a proven way to generate technical and commercial innovation, promotes healthy diversity in markets and regulatory models, and would complement the licensed allocation currently envisaged. We would therefore support the type of auction envisaged by Ofcom for much of the Dividend, but to hold back one of the suggested spectrum packages as an Innovation Reserve. Possible candidates for holding back in this way would include channels 66-68 or 35-37.

*Question 10: Do you agree with our proposal that we should package the interleaved spectrum in a way that would be suitable for use by local television services, but not reserve spectrum solely for this use?*

The packaging of interleaved spectrum in a way that would be suitable for local TV is tantamount to a decision of favour of local TV, since the spectrum planning requirements are so specific. We would favour instead the availability of all interleaved spectrum for licence-exempt applications, which may turn out in the event to be a more future-proof way of facilitating the provision of local multimedia services than a narrow DVB-T broadcast model.

*Question 11: Do you agree with our proposal to package the spectrum in a way which does not preclude mobile broadband use, but to take no further action in relation to this use?*

*Question 12: Do you agree with our proposal that we should not intervene in the award of this spectrum to reserve spectrum for DTT? Do you agree that we should package the spectrum in a way which is suitable for DTT use?*

Yes, we agree that any auction should as far as possible be technology and service neutral. We would note that services that may act as a substitute for mobile broadband or even DTT may emerge through the innovation fuelled by opening up low power licence-exempt applications.

*Question 13: Do you consider that we have included in our analysis the most material risks in relation to market failure?*

Our comments are not so much on the details of the analysis as on the fundamental presumption - with which we disagree - that licence-exemption is a regulatory intervention just like pre-determination for a specific use, that needs to be justified in those terms.

*Question 14: Do you agree with our proposal to auction licences for the use of the available UHF spectrum?*

See response to question 9 above.

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<sup>8</sup> For a fuller discussion of the benefits of licence-exemption see New America Foundation Working paper 14, available online at <http://www.newamerica.net/files/WorkingPaper14.DTVWhiteSpace.deVries.pdf>

*Question 15: Do you agree with Ofcom's proposals as to the timing of any auction? If not, what alternative proposal would you make and why, and what evidence and analysis can you provide in support of your alternative proposal?*

On the basis that an Innovation Reserve is held back, we do not disagree with the indicative timing given in the consultation.

*Question 16: Do you have any views on which of the packaging options identified for the cleared spectrum would be most suitable?*

See comments on the Innovation Reserve in response to question 9 above.

*Question 17: Do you have any views on which of the packaging options identified for the interleaved spectrum would be most suitable?*

We consider that all of the interleaved spectrum should be made available for low-power licence-exempt applications.

*Question 18: Do you have any views on which of the auction design options would be most suitable?*

We have no comments at this stage on auction design

*Question 19: Do you agree with Ofcom's proposals for the non-technical terms of the licences to be awarded for use of the UHF spectrum?*

We have no comments at this stage on this aspect of the proposals

*Question 20: Do you agree with the analysis of the options as set out in this Impact Assessment?*

The Impact Assessment mirrors the other parts of the consultation in presenting licence-exemption as a regulatory intervention just like pre-determination for a specific use, and in effectively ignoring the potential for extensive licence-exempt use of the interleaved channels. In these areas therefore we do not agree with its analysis.

## **Contact Details**

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