OFCOM CONSULTATION: SECURING LONG TERM BENEFITS FROM SCARCE SPECTRUM RESOURCES

SKY'S RESPONSE

Introduction

1. The sub-1GHz spectrum is a scarce and highly valuable and desirable asset. The availability of spectrum in this range provides significant opportunities for potential users, and decisions taken by Ofcom around the use of such spectrum will be hugely influential in the future development of the various services that are able to take advantage of such spectrum. The availability of this spectrum also presents the UK with a unique opportunity to ensure that it is at the forefront of international efforts to maximise potential value of this asset for the benefit of consumers and the UK economy. In particular, this provides an opportunity to help deliver universal and affordable wireless broadband access in the long term, notably through the availability of licence-exempt spectrum.

2. Sky recognises that Ofcom has taken strides towards more creative management of spectrum through TVWS and geo-location database technologies, to manage the use of unused interleaved UHF spectrum dynamically. The UK is, however, at risk of being left behind as other countries lead the drive to more innovative and efficient uses of UHF spectrum, in particular to meet the steeply increasing demand for more mobile data capacity. A licensed-only approach, or even a predominately licensed-only approach, is unlikely to address consumers' growing demands for wireless data services and applications. [1]

3. The position reached by Ofcom in the consultation document is that the 600 MHz band should, in light of the release of the 700 MHz band for (licensed) use for mobile broadband, not now be auctioned through a market-led approach, but instead significant amounts be licensed to maintain or increase DTT capacity. Sky recognises that the UK will need to take into the implications of the WRC12 decision concerning use of the 700 MHz band for mobile data in re-planning the DTT platform. However, Sky considers that an approach whereby significant amounts of the 600 MHz band are licensed to DTT broadcasting in the long term, particularly without requiring the introduction of

[1] See the report by Richard Thanki "*The Economic Significance of Licence- Exempt Spectrum to the Future of the Internet*" (June 2012).

efficiency improvements in the broadcast technologies used, would miss a unique opportunity for assisting the development of innovative, new services. It would not strike the right balance between potential uses of the 600 MHz band, would not be in the interests of consumers, and also risks placing the UK at a competitive disadvantage compared to other countries.

Ofcom needs to act in a manner consistent with its regulatory duties

4. Ofcom recognises that, in performing its role of determining the future use of this spectrum (in both the short and long term), it needs to balance competing demands for this scarce resource, and act in a manner that is consistent with its regulatory duties.

5. In line with Ofcom's assessment of the need to balance actual and potential uses, Sky itself has multiple interests in the use of this spectrum. On one hand, Sky is one of the largest independent DTT channel operators on the DTT platform, and so has an interest in the availability of reasonably priced spectrum from more than one commercial multiplex operator. On the other hand, Sky is increasingly interested in the availability of attractive spectrum (both on a licensed and unlicensed basis), to be able to offer innovative wireless data services to consumers, businesses and mobile operators, including through its Wi-Fi operation, The Cloud.

6. Sky considers that a decision now to license the entire, or significant amounts of, the 600 MHz band in the long term to maintain or even increase capacity for the DTT platform, particularly in the absence of introducing efficiency-enhancing developments in broadcasting technology, would not be in the interests of consumers or the UK economy. It would thus not be consistent with Ofcom's general duties – notably to secure the optimal use of spectrum, and to encourage investment and innovation. Sky considers that Ofcom's approach is not sufficiently progressive and seeks to provide undue protection to the DTT platform, through the continued use of inefficient and legacy broadcasting technology rather than the adoption of more efficient technologies already widely used elsewhere in Europe. This proposed approach would result in lost opportunities, particularly in the long term, at the expense of the benefits of making valuable spectrum available for new and innovative data uses - in particular, on an unlicensed basis (whether in a contiguous block or interleaved).

Ofcom is underestimating the benefits of unlicensed spectrum for mobile data usage

7. Ofcom acknowledges in the consultation document that there is increasingly likely to be a capacity crunch on mobile networks, and that under different growth scenarios, mobile data capacity can be expected to experience an **80-300** fold increase by 2030. Ofcom also acknowledges that **half** of this predicted increase in demand can be expected to be served by offloading mobile data onto fixed (wireless) networks, including Wi-Fi

networks.[2] Ofcom notes that there is a general consensus that there will be significant future growth in mobile data consumption.[3]

8. These projections are consistent with those of the European Commission, who have also noted that exponential growth of wireless data traffic can be expected: it noted in a recent presentation that European Wi-Fi networks already carry up to 20 times more internet data traffic than all cellular networks combined, that Wi-Fi traffic growth is c.4-6 times that of cellular data growth, with 4 out of 5 new wireless technologies using unlicensed spectrum.[4] In the UK, Wi-Fi carries around 70% of smartphone data traffic: the evolution of Wi-Fi technologies has made the experience of signing on to a Wi-Fi network seamless and it is becoming very difficult to buy any kind of device which doesn't have Wi-Fi built-in. This is something the MNOs themselves have recognised by either pushing data traffic onto third party Wi-Fi networks or deploying their own Wi-Fi networks.[5] The growth of human and intelligent machine users can be expected to place increasing demands on Wi-Fi capacities.[6]

9. Sky agrees that there will be an increasing need not only to satisfy demand for more licensed spectrum for data usage, but also to balance this by substantially increasing the amount of unlicensed spectrum available to meet the exponential growth of traffic expected over Wi-Fi for new diverse, innovative uses.

10. Ofcom has given insufficient consideration to the benefits of making attractive spectrum available on an unlicensed basis.[7] Ofcom makes some reference to white space devices operating in (licensed-exempt) interleaved spectrum, and acknowledges the scope for MNOs to continue to offload traffic onto Wi-Fi networks in future.[8] However, it has not sought to investigate fully the ability of (unlicensed) approaches to keep up with future growth in demand for mobile data, and therefore the benefits of making available spectrum for such use (including on a contiguous as well as interleaved basis).

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2 Paragraph 1.10, 3rd bullet, of Ofcom's consultation document.

3 Paragraph 3.8 of the consultation document.

4 Source: European Commission – presentation by Pearse O'Donohue (Head of Radio Spectrum Policy Unit, DG Infosoc): http://www.cambridgewireless.co.uk/Presentation/CWS-EC_Pearse%20Donohue.pdf (April 2012).

5 The MNOs have adopted this practice, notwithstanding the significant amounts of sub-1GHz spectrum either licensed or available to them – in the 800 MHz and 900 MHz bands. In contrast, the only block of unlicensed spectrum available for Wi-Fi is above 2.4GHz, a band which (as Ofcom recognises) has less attractive propagation characteristics compared to sub-1GHz spectrum.

6 See the *Thanki* report, *ibid.*

7 Sky notes that Ofcom explicitly notes that its current modelling work has not taken account the benefits of using sub-1GHz spectrum, with respect to off-loading traffic from the heaviest usage areas onto Wi-Fi networks. (Paragraph 3.49 of the consultation document.)

8 Paragraph 3.40 of the consultation document.

11. As outlined in the *Thanki* report, there are many and varied possible uses envisaged for unlicensed spectrum now, and in the future (including smart meter reading, health and environmental monitoring, remote control systems, disaster recovery systems and so on). As for Sky, it continues to investigate and trial new technologies, the development of which would be facilitated by the availability of unlicensed sub-1GHz spectrum, with potential applications including:

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12. In light of the benefits that would arise from such innovations, and the likely inexorable growth in demand for unlicensed spectrum, Sky suggests that Ofcom undertakes a more comprehensive assessment of the short to long term opportunities and benefits that would arise from making sub-1GHz spectrum (including the 600 MHz band) available on a licence-exempt basis. Such a review would help address important questions that remain to be considered, such as whether contiguous blocks of unlicensed spectrum should be made available, in addition to interleaved spectrum available for TVWS use, and what is the optimal balance between uses in the 600 MHz band. As part of such a review, Ofcom should consider further the potential costs of licensed and unlicensed solutions given that, in general, the latter involves significantly lower costs than the former.[9] Only in light of such a comprehensive review can Ofcom ensure that long term decisions concerning the balance of competing demands for such spectrum, and the availability of spectrum on a (solely or predominately) licensed basis or unlicensed basis, are consistent with Ofcom's general duties.

Ofcom has sought to give undue protection to DTT services

13. As noted above, Sky has a significant interest in the DTT platform, being a broadcaster of a number of channels over the DTT platform, and being a shareholder in Freeview. Sky acknowledges that the DTT platform plays an important role in supporting the availability of core PSB services, and also provides viewers with an alternate means of accessing a wide choice of broadcast channels.

14. Ofcom's approach is to re-plan the DTT platform using the 600 MHz band in the long term to support not only a range of channels similar to that currently available, but potentially to support more SD and HD channels. Ofcom's research indicates, however, that consumer demand for more (free) SD and HD channels from current levels is marginal.[10] This research is consistent with the recent experience of the DTT platform: the demand for more SD channels, where capacity has become available, is becoming restricted to genres to which consumers attach marginal value (notably teleshopping channels), while the business case for further HD channels is, and can be expected to

[9] This is due to the lower cost of deploying Wi-Fi hotspots compared to constructing a macro cell network built using licensed spectrum.

[10] See Figures 12, 13 and 33 of the BDRC consumer research annexed to Ofcom's consultation document.

remain, challenging (as reflected by Channel 5's failure to take up gifted capacity on Mux B).

15. Ofcom notes the role that IPTV developments will play in future demand for DTT capacity, but appears to dismiss its relevance on the basis that IPTV is more likely to be used for on-demand TV consumption rather than linear broadcast TV. Sky considers that the increasing potential for IP delivery for linear broadcast channels can be expected to impact demand for DTT capacity considerably within the timeframe of this review.[11]

16. Further, greater steps could be taken to improve the efficient use of (existing and future) DTT services of the spectrum allocated to them. Ofcom recognises, in paragraph 4.35 of the consultation document, that there are technological developments which could change (i.e. reduce) the amount of spectrum allocated to broadcast DTT channels. However, concerns about the need for continued simulcasting of SD channels, until there is greater adoption of second generation devices, appears to push Ofcom away from overseeing their introduction.

17. Although the UK DTT network has recently undergone a major re-planning exercise as part of the DSO programme, the network architecture failed to take account of technologies already widely adopted in other countries such as Single Frequency Networks, DVB-T2, MPEG4 / H264/AVC. The use of these technologies could be introduced in a way that is not disruptive to consumers and which could lead to a reduction of at least 33% in DTT's spectrum requirements.

18. A further opportunity has been missed through the renewal process, through to 2026, for the commercial multiplex licences – no incentives or policy guidelines were put in place to encourage the introduction by the commercial mux operators of newer, more efficient technologies.[12]

19. Ofcom appears to be setting a threshold of the "*universal adoption of second generation receivers*"[13] before relaxing its approach towards the need to 'simulcast' services using different technologies – preventing the DTT platform from benefiting from efficiency improvements. Sky considers that this is an unduly cautious approach, particularly in light of the demand for impacted spectrum in the 600 MHz band for other valuable, innovative uses. Ofcom could play a greater, proactive role in encouraging the switch to more efficient technologies, for example by updating its DTT Reference Parameters.

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11 This is particularly the case for smaller DTT channels (as evidenced by existing IP broadcast channels that are available on the DTT platform via MHEG applications).

12 In its final statement on the renewal of Muxes C&D, in January 2012, Ofcom noted that (in relation to a request by Sky to consider updating the DTT Reference Parameters) "*it is our intention to consider the scope of the work involved and how we intend to proceed*" (paragraph 3.22). As far as Sky is aware, Ofcom has not yet done so, despite the present consultation process, and the current consultation on the Mux B renewal, providing such an opportunity for Ofcom to do so.

13 Paragraph 4.47 of the consultation document.

This would help incentivise (in particular) commercial mux operators and device manufacturers to switch to/incorporate these newer technologies, which in turn can be expected to help seed demand for second generation receivers. This would reduce the extent of simulcasting channels, in a shorter time-frame, and could achieve a platform transition that is not disruptive, but works in tandem with the existing replacement cycle of devices that integrate DTT tuners (notably TVs).

20. In addition, Sky acknowledges that Ofcom has plans to introduce a regime of AIP post-2014. In the short term at least, however, this will amount to little more than an indirect tax on DTT broadcasters, with mux operators expected to pass the extra cost on to broadcasters, through their contracts for DTT capacity.

21. Sky does not therefore agree that the evidence points to the need for the entire 600 MHz band to be allocated to DTT broadcasting in the long term, and that the question of the optimal allocation of sub-1GHz spectrum (and in particular in the 600 MHz band) between competing actual and potential uses should be considered further, in light of Ofcom's duties.

Opportunities for short term use should be encouraged

22. Ofcom contemplates that, were the 600 MHz band to be used for DTT in the long term, some shorter term use should be enabled. Notwithstanding Sky's overall position on the provision of significant amounts of 600 MHz spectrum for DTT use as set out above, Sky agrees with the general approach that opportunities for short-to-medium term use should be encouraged (including prior to the 700MHz band being cleared).

23. Sky considers that there is a role, in particular, for short-to-medium term unlicensed use of unused spectrum (option (a), as set out in paragraph 6.53(b) of the consultation document) in addition to Ofcom's option (b) of "innovation reserve".[14] The immediate release of spectrum in the 600 MHz band, which is already cleared and available, could give the promising UK TVWS industry a significant early boost.

Recommendations

24. The UK should strive to be at the forefront of the drive to free up more sub-1GHz spectrum for alternative high speed data-based uses, and that it is in the interests of consumers and the UK economy generally for sufficient unlicensed spectrum to be made available - to serve the exponential growth in demand for connectivity and devices using Wi-Fi. Strong incentives need to be introduced, however, for all users of this spectrum, given its scarcity and attractive propagation properties, to encourage more efficient use. Ofcom's consideration of its strategy for sub-1GHz spectrum will play an integral role in

[14] There would also be a benefit in greater certainty about such short term opportunities, such as an indication of how much spectrum, in which parts of the UHF band, would be available for what period and timetables for its availability.

achieving these aims and it should consider further the optimal balance of uses, in particular in the 600 MHz band.

25. Ofcom's strategic review therefore provides a key opportunity to influence the development of new services in the UK. The fact that there remains uncertainty over the development of such services should serve to prompt Ofcom to exercise caution over mandating particular existing uses in the long term, for fear of hindering innovation.

26. There are a number of further steps that Sky urges Ofcom to take, following on from this consultation:[15]

    (a) Sky recommends that Ofcom should build on the UK's existing policy of promoting the use of TVWS and carry out a further review of, in particular, the amount of unlicensed spectrum available, in light of the growing opportunities for Wi-Fi and other unlicensed applications in the UHF band, to ensure that over the long term there will be a sufficient supply of spectrum to meet and serve the predicted growth in demand.

    (b) As part of optimising the efficient use of UHF spectrum, and ensuring that spectrum is not allocated to DTT in a manner that encourages its continued, inefficient use (in the short and long term), Ofcom should also examine at the earliest opportunity the further steps that can be taken by, in particular, commercial multiplex operators to ensure their efficient use of allocated spectrum. A move to more efficient technologies – such as AVC, MPEG4 and DVB-T2 (as well as HEVC in the medium term) - should be encouraged at the earliest opportunity, alongside incentives (such as AIP) to use alternative, innovative means of distribution, such as IP delivery.

    (c) As part of the planning for WRC 2015, Ofcom is also encouraged to undertake a major review of the amount of UHF spectrum currently occupied by DTT, with a view to examining how much can be freed up over the following 5 to 7 years (through the removal of barriers to innovation and the use of new modulation and compression technologies[16]), and made available for other, new and innovative uses.

    (d) Ofcom is also encouraged to ensure the short term provision is made for unlicensed use (for example, TVWS via the database management scheme for unlicensed low power use) until such time as spectrum in the sub-1GHz (and 2.6GHz) bands is occupied. Not only would this be an efficient, short-to-medium term use of such spectrum, it would help counter any incentive for spectrum to be acquired but not used, as happened post the 3G auction in 2000. This

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15 We note that several of these points are made in the joint response from the Cambridge WS Consortium and we wholly endorse their response in these areas.

16 As identified in the Zetacast report "*Technical Evolution of the DTT Platform*" (January 2012) referred to by Ofcom in the consultation document.

principle should apply equally to the 600 MHz and 700 MHz bands, until their designations are fully settled, to ensure that such spectrum isn't set aside as a 'hedge' against future requirements.

Sky **June 2012**