Cambridge White SpacesConsortium response toOfcom's consultation on the future of the UHF bands

7th June2012

This response represents views of the Cambridge White Spaces Consortium[1].

Introduction

We commend Ofcom's decision to review the future use of the UHF bands and are pleased to contribute our combined thoughts here.

The UHF bands have delivered a rich cultural and economic harvest over many decades and we believe that they can yield even greater rewards in the future,by enabling more seamless and higher performance wireless access to the Internet, as well as the latest advances in broadcasting and machine to machine communications.

The favourable propagation characteristics of these bands support cost effective network coverage over larger distances and enable wide area networks to reach indoors to a greater extent than higher frequenciespermit [1]. In this way, the UHF bands are complementary to other bands, in supporting broadband Internet access via a range of fixed, portable and mobile devices.

It is vital that the UHF bands are openedwith as much flexibility as possible, to encourage innovation and allow the market to respondmore rapidly to advances in technologies and changing consumer requirements.

To increase flexibility, we believe that Ofcom should facilitate additional licence-exempt access, secured by geolocation databases.Licence-exempt and licensed uses are complementary. Licence-exempt access can offer low barriers to entry that would encourage investment and innovation, in turn, driving increased consumer benefits from wireless applications and services [2] – [4].

Ofcom should take into account these potential economic benefits, as well as the potential social benefits from enabling rural communities to be served by cost effective infrastructure, for example[2].

Taking a broader view of the potential value from UHF

In our view, Ofcom should take a broad view of the potential benefits from the UHF bands. There is an international trend to reduce broadcast spectrum bandwidthin favour of mobile broadband services. However:

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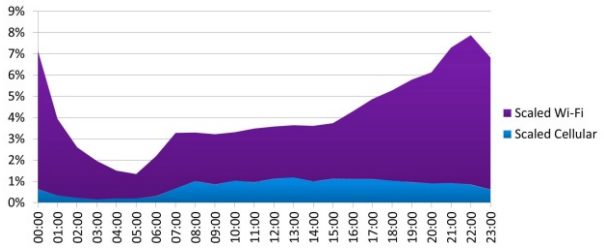
[1]Members include:*Adaptrum, Alcatel Lucent, Arqiva, BBC, BSkyB, BT, Cambridge Consultants, CRFS, CSR, DTG, Microsoft, Neul, Nokia, Samsung, Spectrum Bridge, TTP* and *Virgin Media*. *Google* also contributed to the views.

[2]Trials in the UK and US have indicated that the use of TVWS frequencies on licence-exempt basis can enable broadband access to rural communities very cost effectively.

- The Digital Terrestrial Television services, which are highly valued, are likely to remain in operation for decades to come, and the clearance process is likely to be slow compared to the rate of mobile data growth.DTT has a single harmonised European band, unlike mobile which has access to numerous alternative harmonised spectrum bands.White space technologies could be used to enable additional capacity for mobile device users, quickly, without disrupting current DTT services[3]. Enabling access to the TV white spaces will increase the efficiency of spectrum use in the parts of the UHF bands which are retained for broadcasting
- The growing demand for mobile data services means that expansion of spectrum allocation to mobile broadband networks will not be sufficient, by itself. Already we can see that a substantial amount of the traffic to such devices is conveyed using local area 'offload' networks – using Wi-Fi, as illustrated in the chart below. TV white spaces can be used to enhance this



[*Source: Thanki, Mobidia/Informa*].

- Around the world, regulators are starting to recognise the importance of sufficient spectrum for licence-exempt use.Recent US legislation made an important step in this direction [5]. In Europe, NeelieKroes' delivered a speech at Mobile World Congress, in February 2012, calling for more spectrum sharing and for spectrum to be 'reserved for Wi-Fi like systems' [….. *"if we preserve the space for systems like Wi-Fi, we can offload huge amounts of broadband traffic from mobile networks onto the fibre backbone. Freeing up mobile spectrum for the truly mobile traffic."].*

International developments may, in due course, lead to harmonisation of 700MHz for mobile use and, if implemented,the displacement of DTT services from the 700 MHz band. To enable the UK to respond to these developments in a timely way, whilst making most efficient use of the spectrum, we urge Ofcom to make unused channels in the 600 MHz band available as soon as possible, for DTT services[4] and white spaceapplications.Theseapplications would include the following:

- Rural Broadband - enabling affordable access for remote communities
- Machine to Machine/Internet of Things applications – such as smart energy solutions

[3] Through the use of geolocation databases, as outlined in Ofcom proposals for enabling access to the TV white spaces.

[4] This band has already been coordinated internationally for the provision of DTT services and will have been cleared by the time Digital Switchover is complete.

- Other potential uses such as mobile network offload – when higher frequencybands that couldoffer greater capacity (such as 2.3-2.4 GHz, 3.4-3.6 GHz and 5 GHz) are not available, TVWS systems at UHF frequencies could be used for offloading.

Rather than being left fallow,the spectrum should be kept open for DTT services and white space applications, until a new licensee's infrastructure is actually ready to use it.

In conclusion

In deciding on the future of the UHF bands, we urge Ofcom to set a course towards greater flexibility, whilst protecting the incumbent licensed services. By introducing database controlled, licence-exempt access to the TV white spaces, it will be possible to increase available spectrum rapidly, to meet evolving market requirements.

Since the enabling white space technology is now at an advanced stage of developmentand has been demonstrated successfully in a number of trials, including the most recent, in Cambridge, Ofcom should urgently progress development of the enabling regulation[5]. Theuse of the white spaces should be exempt from licensing, across the frequency range spanned by broadcasting (currently 470-790 MHz), whilst protecting incumbent DTT and PMSE services. This important first step will serve as a useful foundation for securing the maximum value,to UK citizens and consumers, from the UHF bands in the future.

References

1. Motley and J. Keenan. Personal communication radio coverage in buildings at 900 MHz and 1700 MHz. Electronics Letters, 24(12):763/764, June 1988.
2. R Thanki, "The Economic Significance of Licence-Exempt Spectrum to the Future of the Internet", June 2012.
3. Stanford Report: Milgrom, Paul R., Levin, Jonathan D. and Eilat, Assaf, The Case for Unlicensed Spectrum, October, 23 2011. Available at SSRN: http://ssrn.com/abstract=1948257.
4. Consumer Federation of America, The Consumer Benefits Of Expanding Shared Used Of Unlicensed Radio Spectrum, Mark Cooper, 29th November, 2011. http://www.consumerfed.org/pdfs/Consumer-Benefits-of-Shared-Use-Spectrum.pdf
5. HR3630 (Middle Class Tax Relief and Job Creation Act of 2012), TITLE VI—PUBLIC SAFETY COMMUNICATIONS AND ELECTROMAGNETIC SPECTRUM AUCTIONS.

[5] Further studies will be required to optimise the calculation of the geolocation database contents, which we see as an on-going process, enabling the sharing framework to adapt to advances in technologies and the evolution of market conditions.