



**OFCOM – DEVELOPING A FRAMEWORK FOR THE LONG TERM FUTURE OF  
UHF SPECTRUM BANDS IV AND V  
INPUT FROM BRITISH SKY BROADCASTING PLC**

1. This submission constitutes the response of British Sky Broadcasting plc ("**Sky**") to Ofcom's call for input regarding the development of a framework for the long term future of ultra-high frequency ("**UHF**") spectrum bands IV and V, dated 20 April 2011 (the "**Call for Input**").
2. In this Call for Input, Ofcom has asked stakeholders for comments on "*how the future use of UHF spectrum will further the interests of citizens and consumers and what if any issues arise from this perspective*". Sky believes that there is strong and immediate interest in using this spectrum for a broad range of services including the provision of wireless broadband ("**Wi-Fi**") services.
3. The spectacular growth of devices with Wi-Fi inbuilt (there are presently more than 5 billion Wi-Fi enabled devices worldwide, a figure which is forecast by Cisco to grow to 15 billion by 2015<sup>1</sup> and by Ericsson to grow to 50 billion by 2020<sup>2</sup>) has demonstrated that technologies based on open standards using unlicensed spectrum have a considerable role to play in the delivery of mobile/roaming services to an increasing number of handheld devices in the market.
4. A report published in March 2011 by realWireless Ltd on behalf of Ofcom notes that "*for most users, in most locations and for most of the time Wi-Fi delivers a useful service, with data rates which support a wide range of services*".<sup>3</sup> The report quotes a study that suggests that Wi-Fi usage in the home may be generating anywhere between \$4.3 and \$12.6 billion in annual economic value for consumers in the United States.
5. The worldwide reality is that consumers are increasingly looking for economic ways to access the same services both inside and outside the home. Many mobile network operators (MNOs) report that around 20% of data traffic is being offloaded in congested public locations.<sup>4</sup> In peak density areas in Hong Kong up to 80% of data traffic is via Wi-Fi networks.<sup>5</sup> In the United States Wi-Fi offload is widely used by AT&T, T-Mobile, Cablevision, Metro-PCS as a key element of their data network. Research in the UK estimates that by 2015 over 60% of data will be offloaded onto Wi-Fi networks.<sup>6</sup>
6. Wi-Fi is also carrying new data traffic as users embrace new applications, such as streaming video, which are unsustainable over 3G in high population density areas. Wi-Fi is

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<sup>1</sup> <http://www.advanced-television.com/index.php/2011/06/01/cisco-15bn-connected-devices-by-2015/>

<sup>2</sup> [http://www.ericsson.com/ni/thinkingahead/idea/110316\\_moving\\_fast\\_1968920151\\_c](http://www.ericsson.com/ni/thinkingahead/idea/110316_moving_fast_1968920151_c)

<sup>3</sup> See Section 3.6.2 of realWireless on behalf of Ofcom "Low-power shared access to spectrum for mobile broadband", March 2011 (the "**realWireless Report**"). Available from <http://stakeholders.ofcom.org.uk/binaries/consultations/combined-award/annexes/real-wireless-report.pdf>

<sup>4</sup> Informa telecoms and media presentation, "Learning from the Femtocell and Wi-Fi Pioneers: best practices in operator go-to-market strategy", 18 May 2011 ("**Informa Presentation**"), slide 16.

<sup>5</sup> Ibid.

<sup>6</sup> <http://www.marketwire.com/press-release/relief-ahead-mobile-data-networks-as-63-traffic-move-onto-fixed-networks-via-wifi-femtocells-1503808.htm>



increasingly being used in the US as a means of providing low cost voice and video calls using VOIP applications with T-Mobile reporting that 5 million of its 34 million subscribers are routing calls over Wi-Fi.<sup>7</sup>

7. In light of this explosion in demand (worldwide data traffic is expected to be 35-times 2009 levels by 2014<sup>8</sup>), it is unsurprising that certain developed countries are already be starting to experience the wireless spectrum shortage that is expected to be widely felt by 2014.<sup>9</sup> Research conducted in 2009 by Mass Consultants Ltd on behalf of Ofcom acknowledged that, primarily for reasons of interference and congestion, Wi-Fi growth is unsustainable in the current licence-exempt bandwidth at 2.4GHz.<sup>10</sup> Similar limitations were identified in the realWireless Report.<sup>11</sup> The problem of congestion and interference in licence-exempt spectrum is especially acute in dense urban areas where Wi-Fi must compete against a myriad of products and services all requiring scarce bandwidth. As demand increases for wireless functionality in a wider range of devices, these bands will become ever more congested.
8. The benefits, in terms of innovative products and services, currently available to consumers in countries with well established Wi-Fi networks will only be available to consumers in the UK if sufficient good quality spectrum is made available. Increasing use of 5GHz for Wi-Fi will help but the propagation characteristics are relatively poor. One alternative solution, as Ofcom should be aware, is TV white space (WS) - the unused frequency that lies between terrestrial television channels – which has the potential to provide additional bandwidth for Wi-Fi services and has far improved propagation characteristics compared to both 2.4GHz and 5GHz.
9. TV WS promises to offer significant advantages to consumers by enabling wide-area Wi-Fi network coverage able to carry significant data capacity at high speeds and, as such, provides a tangible solution to the limitations on existing spectrum use highlighted above. Given the benefits of traditional Wi-Fi, in terms of meeting customer demand and generating economic value for consumers in other countries, we consider that WS Wi-Fi has the potential to provide a significant opportunity in terms of value to society – i.e. to citizens and consumers. In addition to TV WS, the release of 56MHz of spectrum in the 600MHz band in 2013 gives the UK a unique opportunity to increase the spectrum available for WS Wi-Fi services to UK consumers.

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<sup>7</sup> <http://www.tmonews.com/2011/02/t-mobile-says-5-million-customers-use-wi-fi-calling-service/>,  
<http://www.fiercewireless.com/story/t-mobile-usa-offloads-5m-wi-fi-callers/2011-02-16>

<sup>8</sup> <http://download.broadband.gov.uk/plan/fcc-staff-technical-paper-mobile-broadband-benefits-of-additional-spectrum.pdf>

<sup>9</sup> Ibid. and <http://www.fcc.gov/topic/incentive-auctions>

<sup>10</sup> Mass Consultants Ltd. "Estimating the Utilisation of Key Licence –Exempt Spectrum Bands", April 2009. Available from <http://stakeholders.ofcom.org.uk/market-data-research/technologyresearch/research/exempt/wifi/>.

<sup>11</sup> See Section 3.6.2 of the realWireless Report.



10. Ofcom states in this Call for Input that it wants “*the future use of UHF spectrum [to] further the interests of citizens and consumers*”.<sup>12</sup> Sky believes that this objective will best be achieved through the development of a framework for the long term future of UHF spectrum bands IV and V which encourages the development of new and innovative services to meet growing consumer demand. Indeed, this appears to be in harmony with Ofcom’s own aim to “*allow the widest possible range of potential users, in terms of services and technologies to take part in the award for [UHF] spectrum*”.<sup>13</sup>
11. Sky met with Ofcom in late December 2010 to discuss Ofcom’s proposals for making use of cleared spectrum in the 600MHz band and geographic lots of interleaved spectrum (GIS). At that time, Sky highlighted the opportunity for 600MHz spectrum to be used for a wide range of potential uses that could bring great benefits to citizens and consumers. Sky refers Ofcom to its comments of February 2011 in which Sky expressed support for Ofcom’s market-led approach to allocating spectrum in the 600MHz band and GIS.<sup>14</sup> Sky believes that such an approach would help secure proper and fair value, as well as its efficient, use of UHF spectrum, thereby encouraging innovation in downstream services. Such an approach would also be consistent with Ofcom’s general duties including adopting a technology neutral approach; securing the optimal use for wireless telegraphy of spectrum; securing the availability of a wide range of electronic communications services; and having regard to the desirability of encouraging investment and innovation.
12. UHF spectrum is valuable to a variety of different interests which, Sky acknowledges, Ofcom must balance when deciding how to formulate its framework for the allocation of bands IV and V. But in doing so, Ofcom should be minded to ensure that spectrum is used efficiently and available for a wide variety of services that will further the interests of citizens and consumers.
13. It is clear that sub-1GHz spectrum is of value to MNOs. Sky notes, however, that MNOs are already well catered for in terms of spectrum. There is a significant amount of new spectrum coming onto the market in the 800MHz and 2.6GHz bands which more than meets likely requirements for the MNOs growth in data traffic when used in conjunction with more spectrally efficient technologies such as LTE and the ability to re-farm existing 2G spectrum.
14. Ofcom has also noted the potential for developments in DTT to increase the demand for UHF spectrum: more SD or HD FTA channels or new services such as local, 3D or pay services.<sup>15</sup> Sky submits, however, that given the availability of the same or substitutable services to consumers on other platforms, DTT may not be an efficient use of valuable and scarce UHF spectrum. Furthermore, given the current and anticipated availability of HD and 3D TV services, Sky would also dispute Ofcom’s categorisation of these as “*technological developments*”.
15. For all these reasons, Sky believes that Ofcom should not do anything to risk a delay in the release of any unused UHF spectrum as soon as possible (whether by auction in the case of

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<sup>12</sup> Call for Input, paras. 1.6 and 1.9.

<sup>13</sup> Ofcom Consultation, “Digital Dividend: 600 MHz band and geographic interleaved spectrum, consultation on potential uses”, 18 February 2010 (the “**Digital Dividend Consultation**”), para 2.10.

<sup>14</sup> Digital Dividend Consultation, para 4.89.

<sup>15</sup> Ofcom Call for Input, para. 1.13 and the Digital Dividend Consultation, para. 2.12



600MHz or via a database solution in the case of GIS) and allowing the market to decide how it is best deployed to support new services.

16. Sky notes, however, that technical licence conditions for the use of UHF spectrum have the potential to undermine or inhibit the achievement of Ofcom's objectives. In this respect, Sky draws Ofcom's attention to two particular issues: (i) restrictions on the ability for spectrum to be traded; and (ii) protecting DTT services from interference.
17. In its Digital Dividend consultation, Ofcom suggested that:

*"Where the spectrum is not used for DTT... we would favour including [spectrum usage rights] as [technical licence conditions]. If, after award, the licensee wished to provide other services, we would consider any request for variation of the [technical licence conditions]."*<sup>16</sup>
18. A variation request process would hamper the ability for licences to be freely traded and is, therefore, likely to delay the development of new and innovative products and services.
19. In its Digital Dividend Consultation, Ofcom also highlighted the potential risk for services operating in UHF spectrum bands IV and V to interfere with the DTT transmission signal.<sup>17</sup> Ofcom proposed the use of guard bands in the 600MHz band to form minimum separation barriers around DTT signals.<sup>18</sup> Reserving valuable UHF spectrum for DTT guard bands means such spectrum would not be available for new and innovative products and services. Sky is concerned that Ofcom may be overstating the risk to DTT from interference,<sup>19</sup> and these measures may, therefore, be unnecessarily or at least disproportionate.
20. Given the inevitable growth in demand, the interests of consumers and citizens would not be furthered by measures which would hold up or limit the use of valuable spectrum for new and innovative products and services. To that end, Sky would encourage Ofcom to limit itself to reasonable and non-intrusive technical licence conditions. These might be simply requiring that new users of UHF spectrum avoid causing harmful interference to reception of broadcasts from the post-DSO DTT network by well engineered DTT broadcast reception products and systems, or for those new users to provide for effective mitigation measures where such interference is caused.

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<sup>16</sup> Digital Dividend Consultation, para 4.24.

<sup>17</sup> See generally the Digital Dividend Consultation, Ofcom's "Consultation of the assessment of future mobile competition and proposals for the award of 800 MHz and 2.6GHz spectrum and related issues", 22 March 2011 and Ofcom's "Coexistence of new services in the 800 MHz band with DTT", 2 June 2011 (the "**Coexistence Consultation**").

<sup>18</sup> Digital Dividend Consultation, paras 4.24 et seq.

<sup>19</sup> At paragraphs 2.8 and 4.7 the Coexistence Consultation, Ofcom quotes a figure of 760,000 homes which, it states, "*could potentially be affected by this interference problem [/] might lose the ability to receive some or all DTT services*". In reaching this conclusion, however, Ofcom fails to take into account basic shielding technologies. Generally, DTT reception equipment is adequately shielded from interference. Older devices that are more susceptible to interference are becoming increasingly obsolete as newer equipment which offers enhanced DTT services such as HD and PVR technology enter the market. Sky believes that these figures, therefore, vastly overstate the risk to DTT from interference.



21. Notably, there is an opportunity for the UK to be a world leader with regard to WS Wi-Fi and the implementation of geolocation database type services. The UK is already host to a major trial of WS Wi-Fi in Cambridge, involving an impressive set of UK and global technology and communications companies. Sky understands that many of the world regulators are looking to follow Ofcom's leadership in this space, particularly around ensuring interference rules are as permissive as possible.
22. Sky also supports moves to incentivise DTT services to use spectrum as efficiently as possible over time, potentially through an administrative incentive pricing mechanisms, and to allow for trading to enable existing DTT users to realise value from any efficiency gains by potentially making the spectrum available for alternative uses of the spectrum in addition to additional DTT channels.

**Sky**

**15 June 2011**