

Cover sheet for response to an Ofcom consultation

BASIC DETAILS

Consultation title: Spectrum Management Strategy: Ofcom's Approach to and Priorities for Spectrum Management Over the Next Ten Years

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Name Aparna Sridhar

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Spectrum Management Strategy: Ofcom's Approach to and Priorities for Spectrum Management Over the Next Ten Years

About the Dynamic Spectrum Alliance

The Dynamic Spectrum Alliance (DSA) is a global, cross-industry alliance focused on increasing dynamic access to unused radio frequencies. The membership spans multinational companies, small-and-medium-sized enterprises, and academic, research, and other organizations from around the world, all working to create innovative solutions that will increase the utilization of available spectrum to the benefit of consumers and businesses alike.¹

General Response

Usage of wireless networks in Europe is skyrocketing. According to Ofcom's own forecasts, demand for data generated by wireless and mobile devices in 2030 could be 80 times higher than in 2012.² Meeting this demand is essential to promoting technological innovation and economic growth. To enable the next wave of innovation in the wireless sector, Ofcom should:

- Enable robust access to both licence-exempt and licensed spectrum both above and below 1 GHz;
- Pursue dynamic spectrum sharing as a way of improving spectrum utilization;
- Encourage the development of spectrally efficient devices; and
- Make spectrum usage data publicly available.

1. Ofcom should enable robust access to both licensed and licence-exempt spectrum.

Enabling access to both licensed and licence-exempt spectrum is key to meeting increasing spectrum demands. In the past, a balanced approach has fueled the wireless economy, benefiting consumers, innovators, and investors. Exclusive access to licensed spectrum provides the certainty major operators need to make large investments in their wide-area networks, while broad eligibility for access to licence-exempt spectrum fosters widespread contributions to innovation and investment in emerging technologies.³ For instance, because licence-exempt devices are “free from the burden of normal delays associated with the licensing process,” manufacturers can design equipment to “fill a unique need [that can] be introduced into the

¹ A full list of members is available at www.dynamicspectrumalliance.org/members.html.

² See Ofcom, *Spectrum Management Strategy: Ofcom's Approach to and Priorities for Spectrum Management Over the Next Ten Years*, at 5 (Oct. 2, 2013) (Consultation), available at http://stakeholders.ofcom.org.uk/binaries/consultations/spectrum-management-strategy/summary/spectrum_management_strategy.pdf (last visited Dec. 26, 2013).

³ Cf. Consultation at 31 (noting that license-exempt devices serves as “incubat[ors] of innovation”).

market quickly.”⁴ Thousands of new licence-exempt devices are certified each year. Wi-Fi devices are the best known, but Bluetooth,⁵ Zigbee,⁶ and RFID⁷ devices have all also experienced rapid growth in the last several years. Machine-to-machine technologies, which often rely on licence-exempt spectrum, represent a large and growing market as well.⁸

In addition, licence-exempt use complements licensed use. As Ofcom recognizes, Wi-Fi “offer[s] the opportunity to offload traffic from mobile access networks”⁹ and is “likely to remain an important means of supplying wireless data capacity” in the future.¹⁰ The European Commission recently concluded that offloading has saved European mobile network operators approximately 35 billion euros in network deployment costs and projected network savings of 200 billion euros by 2016.¹¹ The Wi-Fi experience also makes clear that greater availability of licence-exempt spectrum increases demand for and the utility of licensed spectrum. Wi-Fi availability has enabled consumers to use their phones and tablets more intensively to access a variety of online content and services.¹² Use and development of these online services in turn drives demand for licensed and licence-exempt network access, creating a virtuous cycle of investment in content, as well as both licensed and licence-exempt access.

⁴ Kenneth R. Carter, Ahmed Lahjouji, & Neal McNeil, FCC, *Unlicensed and Unshackled: A Joint OSP-OET White Paper on Unlicensed Devices and Their Regulatory Issues*, OSP Working Paper Series at 5 (May 2003).

⁵ Bluetooth is a standard facilitating hands-free operation of music players, mobile phones, and other devices.

⁶ Zigbee powers technologies that benefit from ad hoc and mesh networking solutions, such as home automation.

⁷ Radio Frequency Identification (RFID) technologies are used in a variety of industries to track inventory or other objects.

⁸ Analysis Mason, *M2M Is Already a USD 10 Billion Sector*, Sept. 9, 2013, available at <http://www.analysismason.com/About-Us/News/Insight/M2M-growth-opportunities-Sep2013/> (last visited Dec. 26, 2013).

⁹ Ofcom, *Consultation on the Future Role of Spectrum Sharing for Mobile and Wireless Data Services*, at 2 (Aug. 9, 2013), available at http://stakeholders.ofcom.org.uk/binaries/consultations/spectrum-sharing/summary/Spectrum_Sharing.pdf (last visited Dec. 26, 2013).

¹⁰ Consultation at 32.

¹¹ European Commission, *Study on the Importance of Wi-Fi & the Socioeconomic Benefits of Using Small Cell Infrastructures*, at 5 (Aug. 1, 2013), available at <http://ec.europa.eu/digital-agenda/en/news/study-importance-wi-fi-socioeconomic-benefits-using-small-cell-infrastructures> (last visited Dec. 26, 2013).

¹² According to Richard Thanki, Wi-Fi carries more than 69% of smartphone and tablet traffic globally. Richard Thanki, *The Economic Significance of Licence-Exempt Spectrum to the Future of the Internet*, at 8 (June 2012), available at http://research.microsoft.com/en-us/projects/spectrum/economic-significance-of-license-exempt-spectrum-report_thanki.pdf (last visited Dec. 26, 2013).

2. Ofcom should adopt spectrum-sharing policies as a critical strategy for meeting increased demand.

Given the rapid increase in demand for spectrum to support wireless services, it is unlikely that Ofcom will be able to meet that demand solely through a policy of clearing and repurposing spectrum.¹³ Spectrum sharing is an attractive supplement to clearing for several reasons. First, sharing allows efficient use of spectrum. For example, as Ofcom has recognized through its efforts to open up the television white spaces for license-exempt use, enabling opportunistic use through spectrum sharing does not displace existing users; it allows new devices and services to take advantage of spectrum currently lying fallow. Spectrum sharing techniques thus allow users to make the most of a finite resource.

Second, spectrum sharing can make additional spectrum for wireless services available very quickly. As Ofcom has recognized, the process of clearing incumbents and auctioning exclusive licenses can be lengthy and complicated.¹⁴ Spectrum sharing minimizes delays by leaving incumbent operations in place. This flexibility has been demonstrated recently in the Philippines, where the Philippine Government has deployed TV white space radios and connectivity in aid of earthquake and typhoon recovery in Bohol and Tacloban, respectively. Further, spectrum sharing can be utilized in times of transition between clearing and auctioning—for example, databases can enable temporary access to available spectrum before auctions are conducted and before licensed services become operational.¹⁵

Third, spectrum sharing works. Networks relying on shared spectrum have been deployed successfully in the United States.¹⁶ In South Africa, Google's Cape Town trial delivered broadband with a minimum data rate of 2.5 Mbps and peak data rates of 10 Mbps to 10 secondary schools at distances between 3 and 6 kilometers of a base station, without causing harmful interference to incumbent services. Similar and even better performance measurements have been observed in other TV white space trials around the world, in locations as diverse as the United States, the United Kingdom, Singapore, Japan, Korea, the Philippines, Kenya, Tanzania, and Malawi. Likewise, these trials and pilots around the world have operated without causing any harmful interference to incumbent licensees.

As Ofcom continues to develop its spectrum sharing policies, it should recognize that assured access to sufficient shared or license-exempt spectrum is a critical precondition for successful deployment. Device and chip manufacturers hesitate to commit resources to new bands and technologies until there is certainty that sufficient spectrum will be available. For

¹³ See Consultation at 56 (recognizing that the growth in spectrum demands points towards the growing importance of enabling shared spectrum access).

¹⁴ See Consultation at 80.

¹⁵ See Michael Calabrese, *Use it or Share it: Unlocking the Vast Wasteland of Fallow Spectrum* (2011), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1992421 (last visited Dec. 26, 2013).

¹⁶ Amar Toor, *North Carolina Launches FCC-approved TV White Space Network in Wilmington*, ENGADGET, Jan. 30, 2012, <http://www.engadget.com/2012/01/30/north-carolina-launches-fcc-approved-tv-white-space-network-in-w/> (last visited Dec. 26, 2013).

example, the European Commission noted earlier this year that uncertainty regarding which spectrum will be available for mobile broadband across the continent has hindered the deployment of next generation networks.¹⁷ These principles apply equally to licensed and licence-exempt technologies.

Ofcom should also pursue flexible sharing policies that encourage innovation in database development and other sharing technologies such as sensing. In general, Ofcom should set high-level interference criteria and leave to industry the precise technical methods and parameters for achieving incumbent protection.

Overall, the DSA supports and welcomes Ofcom's initiatives to adopt spectrum sharing policies to make additional spectrum available for use and welcomes the opportunity for future collaboration in this area.¹⁸ Many of DSA's members are active participants in trials or other initiatives supporting Ofcom's work to open up access to the television white spaces. In other jurisdictions, DSA members are working on initiatives to share spectrum in other bands with public sector incumbents, including national defense users. DSA looks forward to continued collaboration with Ofcom in this area.

3. Ofcom should encourage the development of efficient devices.

As demands on spectrum increase, Ofcom should adopt policies that encourage the development of spectrally efficient devices. For example, Ofcom should encourage the users of programme-making and special events equipment to adopt the latest, professional-grade, state-of-the-art technology, so that more devices can operate on any individual channel. Ofcom might encourage such improvements by determining protection in its white spaces proceeding based on the characteristics of modern digital microphones. Similarly, Ofcom should consider database-enabled sharing that allows databases to calculate protection requirements based on actual device characteristics, rather than theoretical technical parameters. In this way, if equipment manufacturers develop devices with significantly improved out-of-band emissions, then such devices will be permitted to operate closer to their neighbors than less sophisticated devices. By incentivizing improved device performance, Ofcom will increase spectrum utilization. In addition, the continued development and integration of sensing technology is likely to enable significantly more accurate models, which can further optimize spectrum use.

4. Ofcom should track spectrum data and make as much of that data publicly available as possible.

Finally, the DSA supports Ofcom's proposal to measure the intensity of "actual use of specific spectrum bands," especially for the purpose of identifying spectrum suitable for

¹⁷ European Commission, *Working Document: Impact Assessment on the Measures Concerning the European Single Market for Electronic Communications and to Achieve a Connected Continent* (2013), available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=SWD:2013:0331:FIN:EN:HTML> (last visited Dec. 26, 2013).

¹⁸ See, e.g., Consultation at 13 (highlighting current work on spectrum sharing).

sharing.¹⁹ Because spectrum is a finite resource, understanding where it is used and where it is under-used is a necessary part of developing sound spectrum policy. In order to protect individual users of spectrum and business confidential information, however, usage information should be subject to reasonable confidentiality protections for personal or commercial data.

¹⁹ Consultation at 11.