DSA Calls for Dynamic Spectrum Access to Help Alleviate "the 1,000X Times More Wireless Bandwidth Problem" at PTC

Additional spectrum for mobile broadband allocated in the usual exclusive licensed manner will not meet the "1,000X Spectrum challenge". More license-exempt spectrum allocation, more Wi-Fi and dynamic spectrum access approaches are critically required too, says Prof H. Sama Nwana[1], Executive Director of the Dynamic Spectrum Alliance[2]

Honolulu, Hawaii, 19 January 2015: The exponential growth in data across mobile networks in all continents of the globe is unarguable. The solution to this problem needs a combination of more efficient technology (i.e. more bits per MHz), more mobile sites (both macro, femto and Wi-Fi) and more spectrum (i.e. more MHz) to meet the growth in mobile data, says The Dynamic Spectrum Alliance's[3] (DSA) Executive Director, Prof. H Nwana - ex Group Director of Spectrum Policy at Ofcom, the UK's esteemed communications regulator. This announcement comes as the PTC Conference takes place, bringing together the global telecommunications industry.

Drawing from his experience at Ofcom, Prof. Nwana emphasised with that more 'mobile sites', we need to specifically address the need for (i) more Wi-Fi, (ii) more spectrum, and (iii) *how* the spectrum is accessed. His reasons/positions and key arguments are the following:

1. **More Wi-Fi/More Wi-Fi spectrum**: A recent Report from the European Broadcasting Union (EBU) estimates that "71% of all wireless data to mobile devices in the [EU] was delivered using Wi-Fi".[4] The majority of data delivered to mobile devices is now and increasingly transmitted over Wi-Fi.[5] "Globally, 45 percent of total mobile data traffic was offloaded onto the fixed network through Wi-Fi[6] or femtocell in 2013. . . . Without offload, mobile data traffic would have grown 98 percent rather than 81 percent in 2013."[7] So Wi-Fi and off-loading to Wi-Fi networks are a significant part of the solution to the mobile data problem. More spectrum for Wi-Fi is also critical.

2. **More spectrum sharing is just logical**: It is a fact that most licensed-exclusive spectrum (and to be fair other spectrum bands too) are not being used in most of the places most of the time. New dynamic access technologies exist in 2015 to allow use of this spectrum without interfering with existing licensed users. And we have the well-known 1000X spectrum challenge? Ergo – share the spectrum.

3. **Dynamic Spectrum Access must start to be the norm rather than the exception**: True more non-Wi-Fi spectrum too is needed, but *how* the spectrum is allocated and

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[1] Prior to joining the Alliance, Nwana was Group Director of Spectrum Policy at Ofcom, where he ran UK's Spectrum Policy and spearheaded UK's dynamic spectrum management activities, specifically focusing on TV White Spaces for broadband and other applications. Before this, Nwana was Managing Director at Arqiva and earlier in his career he worked at Quadriga Worldwide Ltd and BT.

[2] The Dynamic Spectrum Alliance membership spans multinational companies, small- and medium-sized enterprises, academia, 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. A full list of members is available at www.dynamicspectrumalliance.org/members.html.

[3] www.dynamicspectrumalliance.org/

[4] *See the European Broadcasting Union, Spectrum Factsheet*, published 17 July 2014, available at http://www3.ebu.ch/files/live/sites/ebu/files/Knowledge/Publication%20Library/Fact%20sheets/ebu-spectrum-fact-sheet.pdf.

[5] *See id.*

[6] Trademark of the Wi-Fi Alliance.

[7] Cisco Visual Networking Index (VNI) Global Mobile Data Traffic Forecast Update 2014.

assigned is also arguably more important. Exclusive licensed spectrum like many countries have done for 3G and 4G spectrums continues to have its place, and I defend that. However, it stands to reason that the 1000X spectrum challenge will *not* be met from new spectrum allocations/assignments on licensed-exclusive bases. Ergo too, the 1000X challenge must grapple with *how existing assigned* spectrum is accessed, i.e. *dynamic spectrum access*.

"So what indeed is dynamic spectrum access? Returning to the sharing theme, dynamic spectrum access refers to a set of technologies which allow wireless users to share access to spectrum: (i) enabling regulators to tailor the technical conditions to the particular location and time where the sharing is to occur; (ii) maximising spectrum usage efficiency and facilitating innovation; and most importantly, (iii) protecting incumbent services from harmful interference. I championed dynamic spectrum access at Ofcom, and I am continuing to do so at the DSA."

Prof. Nwana continued: "With these three positions above 'established', the only questions are whether the solutions to the above 3 positions are feasible enough in 2015 on a scale to start denting the 1000X spectrum challenge problem. Mine and the DSA's position are increasingly affirmative. Let's look at some of the further arguments:

1. *License-exempt networks and more license exemption will help meet growing capacity needs.* Indeed, thousands of new license-exempt devices are produced and certified each year. Wi-Fi devices are just the best known, but Bluetooth,[8] Zigbee,[9] and RFID[10] devices have all also experienced rapid growth in the last several years. Europe's and America's experience with Wi-Fi above also suggest that license-exempt access complements licensed access, driving demand for increased bandwidth. More likely it will continue to grow, as fixed broadband access to customer premises improves and new Wi-Fi technologies, including IEEE 802.11ac and 802.11af, are adopted more widely. Thus, adding to the available (licence exempt) Wi-Fi capacity is at least as important as provisioning additional capacity for networks using licensed spectrum access.
2. *This ability to offload data from cellular networks to Wi-Fi is key and must grow:* it has saved mobile network operators billions of dollars in network deployment costs.[7] Studies of Wi-Fi use make it clear that greater availability of license-exempt spectrum increases both demand for and the utility of licensed spectrum. And Wi-Fi availability has enabled consumers to use their phones and tablets more intensively to access online content and services. Use and development of these online services in turn drives demand for licensed and license-exempt network access, creating a virtuous cycle of investment in content, services, and applications.
3. *Dynamic Spectrum Access is ready now and can enable access even if other users* (e.g. broadcasters) are not cleared from licensed bands (e.g. the UHF bands). Take UHF for example. Dynamic spectrum access in the UHF band will enable valuable broadband coverage and capacity benefits to be gained even if digital terrestrial TV remains as an incumbent in the band. If and when policymakers eventually decide to clear broadcast services from the UHF bands, or broadcasters themselves choose to vacate, moreover, DSA provides a smooth and seamless way to exploit any unused spectrum fragments that result. This can be achieved without the costs and delay entailed by clearance, as a pre-cursor to an auction and exclusive use licensing, for example. Even when parts of the UHF bands have been cleared and assigned, many rural areas are often left without coverage from new networks. Again, the DSA can help by allowing sharing of unused, cleared spectrum, until the new licensee deploys infrastructure in the areas in question.

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[8] Bluetooth is a standard facilitating hands-free operation of music players, mobile phones, and other devices.
[9] Zigbee powers technologies that benefit from ad hoc and mesh networking solutions, such as home automation.
[10] Radio Frequency Identification (RFID) technologies are used in a variety of industries to track inventory or other objects.

4. *Dynamic spectrum access technologies for the UHF band are mature (802.11af is nigh)*: After several years of research and development, the first generation of commercial-grade TV white space equipment is being used in the first commercial deployments around the world. MediaTek – a tier 1 WiFi chipset manufacturer – has announced a roadmap to providing 802.11af chipsets, enabling Wi-Fi in TV bands TV white space technology is already being widely deployed in projects occurring on five continents – please view the Alliance pilots page. These deployments have taken place in locations as diverse as the United States, Namibia, the United Kingdom, South Africa, Singapore, Japan, South Korea, Ghana, the Philippines, Kenya, Tanzania, Uruguay, and Malawi. Each of these projects has occurred with the support and authorizations from the relevant regulatory authorities. *In all cases, access to the Internet was expanded and/or improved without causing interference to incumbent users, including broadcasters. Indeed, across all of these projects there has not been a single report of harmful interference to incumbent users, including broadcasters.* These deployments have provided Internet access to primary and secondary schools, university campuses, libraries, community centers, healthcare facilities, government offices, and small and medium sized businesses. Locations around Europe are hosting many of these efforts. Indeed, UK Ofcom has for the last several years hosted successive technical trials and non-commercial pilots.
5. *Dynamic spectrum access and sharing is moving to other bands too*: this is one for another opinion piece"

"License-exempting more spectrum for Wi-Fi, more and more Wi-Fi off-loading and allowing for true dynamic spectrum access are critical to addressing the 1000X spectrum challenge. Without these, the odds on meeting the mobile data challenge are truly stacked against us," Prof. Nwana concluded.

This announcement comes ahead of the Dynamic Spectrum Alliance Global Summit, which will take place in Manila Philippines on May 6-8, 2015. With an emphasis on the exploration of dynamic spectrum access technologies, business models and regulations, the Philippines' Department of Science and Technology ICT Office and the country's Communication Regulator, the National Telecommunications Commission (NTC) will co-host the Summit. For more information or to register, visit www.dynamicspectrumalliance.org/summit.html or contact admin@dynamicspectrumalliance.org.

For further information about the Dynamic Spectrum Alliance, please visit www.dynamicspectrumalliance.org/, or follow @dynamicspectrum on Twitter. Alternatively joins the Alliance on Facebook or LinkedIn. For all media enquiries, please contact Dana Hare at dana.hare@proactive-pr.com or +44 7795 615466, or Russell Cafferty at russell.cafferty@proactive-pr.com.

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About the Dynamic Spectrum Alliance
The Dynamic Spectrum Alliance is a global organization advocating for laws and regulations that will lead to more efficient and effective spectrum utilization. The DSA's membership spans multinationals, 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 amount of available spectrum to the benefit of consumers and businesses alike. Visit http://www.dynamicspectrumalliance.org/.