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European Commission  
Radio Spectrum Policy Group – Secretariat  
DG CNECT B4: Spectrum – Office: BU33 7/55  
B-1049 Bruxelles  
Belgium

## RE: Dynamic Spectrum Alliance Response to the RSPG consultation on Draft Opinion on a long-term strategy on the future use of the UHF band (470-790 MHz) in the European Union

Dear Sirs:

The Dynamic Spectrum Alliance (“DSA”), a global, cross-industry alliance of more than forty members,<sup>1</sup> would like to thank the RSPG for the opportunity to comment on its Draft Opinion on a long term strategy for the UHF band. Many of the DSA’s members have developed and commercialized technologies that safely leverage the unused UHF bands for a variety of wireless applications and so are uniquely qualified to comment on the RSPG’s Draft Opinion. The DSA aims to facilitate ubiquitous and affordable broadband access, through more efficient sharing of spectrum. The UHF band in question has a key role to play, globally, in fulfilling this vision.

As demand for a variety of wireless services grows, many users, including PMSE, emergency services and others, seek access to sub-1 GHz spectrum capacity for their applications. Spectrum below 1 GHz has propagation characteristics that allow signals to travel through walls and obstructions, making it valuable for transmitting signals indoors and over longer distances – a suitable complement to other spectrum bands available on a licence-exempt basis.

At the same time, the distribution technologies for broadcasting and mobile communications have been advancing rapidly, especially over the last decade. The move towards greater use of mobile devices and hybrid distribution networks has created new opportunities to enjoy TV content well beyond what could have been envisaged when the current UHF allocation was made.

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<sup>1</sup> 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](http://www.dynamicspectrumalliance.org/members.html).

In a world in which demand for limited spectrum resources will continue to grow over time, dedicating spectrum bands to specific applications and assigning them on an exclusive basis results in wasted capacity. In order to meet growing spectrum demands, more intensive, intelligent and adaptable sharing of spectrum must be the way forward. The TV bands are a great place to start. In particular, enabling shared, dynamic, licence-exempt access to the vacant TV channels (white spaces) is a vital first step towards promoting flexible, intensive use of spectrum.

Europe is well-positioned to take advantage of complementary dynamic sharing technologies specifically designed to coexist with broadcasting and other licensed uses of the UHF bands. These technologies take advantage of advances in silicon and software, are recently standardised by ETSI and the IEEE and are specifically designed to tap the unused capacity in the TV White Spaces.

- The ETSI Harmonised European Standard, for White Space Devices: [EN 301 598](#) , covers the essential requirements of the R&TTE Directive.
- The 802.11af standard adds TV white spaces to the existing 2.4 GHz and 5 GHz bands used for Wi-Fi, increasing the range of Wi-Fi to benefit consumers and businesses in rural and urban areas.

If broadcasting technologies continue to operate in the band 470-694 MHz for many more years, such as until at least 2030, as recommended in the *Lamy Report on the Future Use of the UHF Band*,<sup>2</sup> it would seem particularly wasteful not to allow licence-exempt access to these frequencies, provided licensed operations are protected from harmful interference.

Looking more broadly than just the future of DTT in the UHF bands, DSA members see the need to balance opportunities for licensed and licence-exempt spectrum in complementary high, medium, and low frequency bands.

## Our Key Messages

### The RSPG should prioritize extending broadband coverage

Ubiquitous broadband access is rightly an important goal for European policymakers. According to Analysys Mason's analysis of 130 studies, a 10 percentage point increase in broadband

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<sup>2</sup> See Pascal Lamy, Report to the European Commission, Results of the Work of the High Level Group on the Future Use of the UHF Band (470-790 MHz), dated 29 August 2014 (available at [http://ec.europa.eu/information\\_society/newsroom/cf/dae/document.cfm?doc\\_id=6721](http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?doc_id=6721)).

connections penetration yields between a 0.26% and a 0.92% increase in GDP. Each additional 1,000 broadband connections leads to the creation of up to 33 new jobs.<sup>3</sup>

Thus, and because of the favourable propagation characteristics discussed above, sub-1 GHz spectrum should be available to deliver more ubiquitous and affordable broadband access. In addition to assigning exclusive use licences for certain frequencies, such as the 800 MHz and 2.6 GHz bands, we believe this goal can be achieved through licence-exempt technology, which is often more affordable and can be deployed by local communities as well as operators. As discussed in further detail below, the DSA members' experience in rolling out broadband in underserved rural and urban areas in locations around the world already bears this out. Europe's experience with Wi-Fi also suggests that licence-exempt access complements licensed access, driving demand for increased bandwidth.

#### Licence-exempt networks will help meet growing capacity needs

We agree that available spectrum capacity for use in wireless networks needs to increase, in line with forecasts of rapidly growing data consumption through mobile devices. 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"*.<sup>4</sup> Increasing cell density and off-loading to Wi-Fi networks will be an important component of meeting increased capacity demands.

The majority of data delivered to mobile devices is now transmitted over Wi-Fi.<sup>5</sup> We are seeing overall traffic volumes growing rapidly, with no reason to believe that the proportion traversing licence-exempt networks will diminish over time. 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.

#### Licence exemption also supports innovation and delivers broader economic value

Globally, the sale and use of licence-exempt devices create hundreds of billions of dollars of economic value each year<sup>6</sup>. Moreover, licence-exempt access can accelerate technology

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<sup>3</sup> Report from Analysys Mason: GSMA and Huawei: Today, tomorrow and the future – managing mobile data demand, December 2014.

<sup>4</sup> 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>.

<sup>5</sup> See *id.*

<sup>6</sup> See Raul Katz, *Assessment of the Economic Value of Unlicensed Spectrum in the United States* (Feb. 2014) available at <http://www.wififorward.org/wp-content/uploads/2014/01/Value-of-Unlicensed-Spectrum->

development, since innovators can introduce products and services without seeking permission from regulators or spectrum licencees.

Indeed, thousands of new licence-exempt devices are produced and certified each year. Wi-Fi devices are the best known, but Bluetooth,<sup>7</sup> Zigbee,<sup>8</sup> and RFID<sup>9</sup> devices have all also experienced rapid growth in the last several years. Machine-to-machine technologies, which often rely on licence-exempt spectrum access, represent a large and growing market as well.

Access to licence-exempt spectrum also allows licensed wireless and wireline broadband providers to increase the reach of their networks and improve network management in congested areas through techniques such as cellular offloading.

- “Globally, 45 percent of total mobile data traffic was offloaded onto the fixed network through Wi-Fi<sup>10</sup> or femtocell in 2013. . . . Without offload, mobile data traffic would have grown 98 percent rather than 81 percent in 2013.”<sup>11</sup>
- For smartphones and tablets in particular, Cisco has found that “daily data consumption over Wi-Fi is four times that of cellular.”<sup>12</sup>

This ability to offload data from cellular networks to Wi-Fi has saved mobile network operators billions of dollars in network deployment costs.<sup>7</sup> Studies of Wi-Fi use make it clear that greater availability of licence-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 licence-exempt network access, creating a virtuous cycle of investment in content, services, and applications.

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[to-the-US-Economy-Full-Report.pdf](#). In the United States alone, the estimated contribution from licence-exempt spectrum use is over \$200 billion per year.

<sup>7</sup> Bluetooth is a standard facilitating hands-free operation of music players, mobile phones, and other devices.

<sup>8</sup> Zigbee powers technologies that benefit from ad hoc and mesh networking solutions, such as home automation.

<sup>9</sup> Radio Frequency Identification (RFID) technologies are used in a variety of industries to track inventory or other objects.

<sup>10</sup> Trademark of the Wi-Fi Alliance.

<sup>11</sup> Cisco Visual Networking Index (VNI) Global Mobile Data Traffic Forecast Update 2014.

<sup>12</sup> Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update: Forecast and Methodology, 2013–2018, at 20.

Dynamic Spectrum Access can enable broadband access even if broadcasters are not cleared from the UHF bands.

DSA in the UHF band will enable valuable broadband coverage and capacity benefits to be gained even if DTT 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 precursor 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.

Dynamic spectrum access technologies for the UHF band are mature

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. The illustration below demonstrates that TV white space technology is already being widely deployed in projects occurring on five continents.



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 commercial pilots.

While current TV white space technologies are based on proprietary technologies, the first generation of standards-based devices are in development. Mediatek, for example, notably demonstrated its first tri-band 5 GHz, 2.4 GHz, and TV white spaces prototype based on the 802.11af Wi-Fi standard in a recent trial in Glasgow, Scotland. More information on trials, pilot projects, and commercial deployments is available on the Dynamic Spectrum Alliance's website.<sup>13</sup>

#### Each regulator that has allowed access to the TV white spaces has done so on a licence-exempt basis

In 2010, the United States Federal Communications Commission implemented regulations allowing fixed and portable devices access to the UHF and VHF TV white spaces on a licence-exempt basis.<sup>14</sup> Regulators in the United Kingdom, Singapore, and Canada likewise have decided to allow licence-exempt access to TV white spaces and are in the process of implementing their regulations.<sup>15</sup> Regulators in many other nations have permitted pilot projects on an interim basis and are now considering regulations allowing licence-exempt access to the TV white spaces. As noted by the head of the ITU's Radiocommunications Bureau, the development of dynamic spectrum access, such as in the TV white spaces, is "essentially in the hands of national regulators in each country. For this, regulators will depend on state of the art best practices which are currently developed by ITU-R Study Groups 1, 5 and 6."<sup>16</sup> To inform these discussions, the DSA has developed Model Regulations, which can be the basis for regulations adopted by regulators globally.<sup>17</sup>

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<sup>13</sup> See <http://www.dynamicspectrumalliance.org/pilots.html>.

<sup>14</sup> The first rules appeared in 2008, but the second set of rules published in 2010 were considered more practical.

<sup>15</sup> See Canada (<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10493.html>); Singapore (<http://www.ida.gov.sg/policies-and-regulations/consultation-papers-and-decisions/completed/Proposed-Regulatory-Framework-for-TV-White-Space--Operations-in-the-VHF-UHF-Bands>); United Kingdom (<http://stakeholders.ofcom.org.uk/spectrum/tv-white-spaces/consultations-statements/>).

<sup>16</sup> François Rancy, Director, ITU Radiocommunication Bureau ITU Radiocommunication Seminar for Arab Countries, RRS13-Arab Tunis, Tunisia on December 13, 2013.

<sup>17</sup> See <http://www.dynamicspectrumalliance.org/submissions.html> (last visited Jan. 5, 2015).

## Conclusion

The Dynamic Spectrum Alliance welcomes the opportunity to comment on the RSPG's Draft Opinion on a long term strategy for the UHF band. Consumers in European will be best served by spectrum policies which encourage efficient use of limited spectrum resources, including in the 470-790 MHz UHF frequencies. Consistent with steps being taken by some of the world's leading spectrum regulators, the Dynamic Spectrum Alliance, therefore, urges the RSPG to support licence-exempt access to unassigned or otherwise unused UHF frequencies, even as the RSPG considers proposals to license portions of the UHF bands in the future.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'H. Sama Nwana', is centered below the text 'Respectfully submitted,'.

H. Sama Nwana  
Executive Director  
Dynamic Spectrum Alliance