Consultation title: **More Radio Spectrum for the Internet of Things**

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Name Prof. H Nwana   Signed (if hard copy)

November 12, 2015

DSA Response to Ofcom's Consultation on More Radio Spectrum for the Internet of Things

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; academic, research, and other types of organizations from around the world[1].

General Response

The DSA is pleased to have this opportunity to contribute to Ofcom's consultation on providing additional lower frequency spectrum for Internet of Things (IoT) applications.

License-exempt access and dynamically shared access to spectrum below 1 GHz will be instrumental in enabling the Internet of Things.

In order to enable a flourishing ecosystem of IoT devices, Ofcom should adopt three strategies:

1. It should ensure that IoT devices have access to spectrum below 1 GHz.
2. It should maximize sharing to make the most of finite spectrum resources.
3. It should ensure sufficient spectrum is available for license-exempt use.

Powering the Internet of Things will require access to frequencies below 1 GHz

The DSA agrees with Ofcom that frequencies below 1 GHz will be important for a number of IoT applications. DSA members' experiences with TV white spaces technology reflect that due to their favorable propagation characteristics, these lower frequencies are very useful in remote and rural areas, where infrastructure tends to be sparser. Because they have a relatively greater ability to travel through floors and walls, moreover, transmissions in these lower frequencies also are well-suited to many home and office applications. Ofcom's TV white spaces pilot, which authorized access to vacant television channels, included a number of examples of IoT applications, ranging from flood detection to high quality image backhaul. The Glasgow TV White Spaces Project, in particular, showed that IoT applications such as remote video monitoring, could be combined with conventional broadband access backhaul, over a single TV white spaces link.

Dynamic sharing is key to meeting the spectrum needs of IoT

A dynamic approach to spectrum access is key to extracting the full value from the rapid innovation occurring in the growing IoT sector.

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

IoT poses new communication network requirements, and the needs of the sector are likely to be diverse:

- Some applications, such as air temperature sensing, may need only infrequent access to the network, whilst other have continuous streams to deliver (e.g. remote video monitoring).
- Some applications need broad channels whilst others can make use of comparatively narrow channels.
- Some have wide area connectivity requirements, whilst others need only local or even personal area range connectivity.
- Some applications depend on ad-hoc connectivity, whilst others can pre-configured and remain fixed in place.
- Some applications make use of device-to-device communications as well as cloud-mediated connections

Dynamic spectrum access can enable sharing between these diverse technologies and incumbent users. It can also allow regulators to make policy decisions on priorities for sharing (such as enabling priority access for emergency service applications). Dynamic sharing tools such as geolocation databases can facilitate broader international markets for IoT devices, by keeping country-specific information in the cloud rather than embedding it in the device. And use of sharing will encourage manufacturers to produce flexible equipment that can make better use of the fragmented and shifting available spectrum capacity, which reflects the inevitable differences in management approach between jurisdictions.

Access to additional license-exempt spectrum will also power IoT applications

By enabling license-exempt access to more bands, regulators can incentivize the deployment of network infrastructure on which the IoT devices rely. This is vital in areas outside commercial viability for conventional operators – particularly required for the rural applications highlighted in the consultation document. It is also clear from the TVWS pilot projects sponsored by Ofcom that many IoT applications would benefit from license-exempt spectrum access to enable end users such as property owners to deploy wireless networks to meet their distinct, localized needs.

By designating sufficient low frequency spectrum for IoT use and by enabling sharing wherever possible, Ofcom can help foster innovation in the next generation of connected devices.

Respectfully submitted,

H. Sama Nwana
Executive Director
Dynamic Spectrum Alliance