Dynamic Spectrum Alliance Limited
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June 24, 2020

Before the
Australian Communications and Media Authority
ACMA
Australia

In the Matter of "Five-year Spectrum Outlook" Invitation for Comment:

The Dynamic Spectrum Alliance (DSA) is a global, cross-industry, not for profit organization advocating for laws, regulations, and economic best practices that will lead to more efficient utilization of spectrum, fostering innovation and affordable connectivity for all. Our membership spans multinationals, small-and medium-sized enterprises, as well as academic, research and other organizations from around the world all working to create innovative solutions that will benefit consumers and businesses alike by making spectrum abundant through dynamic spectrum sharing.[1]

The Dynamic Spectrum Alliance's goals are to make spectrum abundant for broadband to connect the next four billion people, stimulate wireless innovation for next generation broadband, and accelerate an inclusive digital economy. The DSA appreciates the opportunity to respond to the Australian Communications and Media Authority's (ACMA's) invitation for comments on its "Draft Five-year spectrum outlook 2020–24 – consultation".

We encourage the ACMA to consider increased adoption of Dynamic Spectrum Access (DSA) in Australia. This would support national objectives, such as developing a digital economy and smart cities, leveraging and developing artificial intelligence applications, rolling out 5G deployment, and improving digital connectivity in regional Australia. Where radioelectric spectrum is naturally a shared resource, the ACMA should review how license-exempt, lightly-licensed spectrum, spectrum sharing, and similar approaches can be utilised to maximize access to the radio spectrum.

The ACMA noted that there is spectrum sharing momentum in some international jurisdictions, and recognises general interest in the Australian market. Nevertheless, the ACMA indicated that it has not received any detailed sharing proposals for consideration, and therefore, the development of a formal, ongoing DSA regime has not been prioritised by the ACMA at this time. Table 2 of the consultation document states that a paper setting next steps will be published in Q2-3 2020.

The DSA urges the ACMA to reconsider its position and prioritise dynamic spectrum access in Australia today. We believe that the Authority should monitor candidate bands for spectrum sharing and schedule them for initial

[1] A full list of Dynamic Spectrum Alliance members is available on the Dynamic Spectrum Alliance's website at www.dynamicspectrumalliance.org/members.

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investigation during this Five-year spectrum outlook. The DSA has identified different candidate bands for spectrum sharing frameworks in different frequency bands as detailed in the DSA comments to ACMA on its recent New Spectrum Sharing Approaches consultation. [2] We are ready to work closely with the ACMA to share additional information from international experiences and remain open to support domestic trials.

The DSA thinks that shared spectrum in different frequency bands can be used to complement broadband connectivity and be used by WISPs to provide rural connectivity under the Regional Connectivity Program using TVWS, WLAN/RLAN or LTE technologies. Broadband and digital technologies are recognized today not just as an enabling and powerful force for socioeconomic progress, but an increasingly *vital* part of 21st century infrastructure. And while urban communities enjoy the availability of gigabit connectivity, high-speed wireless broadband and high-capacity networks in rural communities globally are lagging behind, resulting in an ever-widening digital gap. While the Australian Government has performed a commendable job in promoting wider access through the NBN and Mobile Black Spot Program, the geography and low population density of rural Australia continue to make it challenging for the provision of affordable broadband in such areas.

Adopting spectrum sharing will enable more users to access scarce and valuable spectrum resources, leading to lower-costs, lower barriers to entry, and most effective allocation for smaller businesses, farmers for agricultural connectivity, etc. This allows for and encourages competition and innovation by providers as well as new entrants to invest more significantly in network deployment instead of spectrum acquisition. As 5G standards and use cases continue to develop, we strongly urge the ACMA to continue to consider more flexible, and multi-authorization licensing arrangements in different spectrum bands as it embraces Australia's future digital economy and society.

To conclude, we urge the ACMA to:

i) Continue to examine opportunities to unlock new bands and access through spectrum sharing and DSA techniques;
ii) Consider the costs and benefits of sharing a spectrum band versus exclusive licensing when examining new opportunities for access; and
iii) Significantly improve the information exchange between government, industry, and public regarding spectrum use to enhance the efficient utilization of all spectral resources.

Please do not hesitate to contact me for further discussions or clarifications on the subject matter.

Best regards,

Martha SUAREZ
President
Dynamic Spectrum Alliance

[2] http://dynamicspectrumalliance.org/wp-content/uploads/2019/09/2019-09-DSA-ACMA-Spectrum-Sharing-Comments-Final.pdf

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1. What are the expected impacts of the COVID-19 pandemic on the short- and medium-term capacity of your industry?

ACMA states that the communications and media sectors are playing a critical role in enabling Australian consumers, businesses and governments to communicate during the COVID-19 pandemic. At a global level, the International Telecommunications Union (ITU) acknowledges the important role of information and communications technologies—of which spectrum is a key enabler—in helping to governments, businesses and individuals cope with the pandemic.[3]

During the current situation, citizens are working from their home, most of them are relying on Wi-Fi Networks. The DSA has published and statement recommending National Regulatory Authorities (NRAs) to employ accelerated and streamlined processes to make necessary spectrum available that is already evaluated for broadband service and wireless backhaul. Access to this spectrum on a nation-wide basis will enable critical applications and services, especially for emergency communications and broadband access that supports tele-medicine, tele-work, distance education, and online commerce. These crucial services rely on sufficient spectrum during the pandemic time when tens of millions of people must stay at home.

NRAs should focus on digitally divided communities who stand to lose out the most during this crisis, including rural and remote areas, and also **support smaller providers that serve these communities with access to shared and unlicensed spectrum**. To enable broadband deployment and forward-looking preventive spectrum policies, a combination of spectrum bands should be made available free of charge, under a **license-exempt** access scheme like Wi-Fi, or via a dynamic spectrum access model such as TV White Space, self-coordinated light licensing such as E-Band, or tiered spectrum sharing models. Taking this action will help to facilitate terrestrial and non-terrestrial emergency communications and affordable broadband access for those that are vulnerable and otherwise isolated.

DSA also calls for coordinated regulatory actions across ITU regions and sub-regions on topics such as frequency coordination, flexible use, simplified type-approval process, equipment import/export and interconnection.

2. Do you have any feedback on the ACMA's approach to its spectrum work program in the current environment? Do you have alternative proposals or priorities?

Managing spectrum efficiently and effectively for the benefit of all Australians is a key priority for the ACMA.[4] To that aim, the ACMA recognizes that "*additional spectrum releases across low, mid and high band spectrum forms the basis for our allocation work program. These allocations are intended to make additional spectrum available for 4G and 5G services in Australia, delivered via wireless broadband (fixed and mobile) and satellite, and enable a range of uses to be supported under a mix of licensing options.*" As Australia continues to transition towards a

[3] ITU, 2020, accessed 27 April 2020, <https://www.itu.int/en/Pages/covid-19.aspx>.
[4] ACMA, 2019, accessed 23 April, <https://www.acma.gov.au/publications/2019-08/report/corporate-plan-2019-20>.

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digital economy and digital society, which will entail 5G deployments, new generation of Wi-Fi, smart city and IoT applications, it will require a significant expansion in the available license-exempt spectrum across low (sub 1 GHz), mid (1-7 GHz), and high (above 7 GHz) bands, in order to satisfy the projected increases in bandwidth consumption, especially at the network edges. In this regard, spectrum sharing will complement exclusive licensed spectrum access and the ACMA should recognize the premise about additional spectrum releases in low, mid and high band spectrum should be also consider for license-exempt access.

The DSA celebrates that mid-band spectrum in the 2 GHz and 3.7-4.2 GHz bands is being progressed this year towards a preferred planning option and that a planning paper is expected to be published in Q2-Q3 2020. The DSA is convinced that this band presents great opportunities for shared spectrum and could be used for fixed wireless operations by wireless internet service providers.

The ACMA can also employ a "use-it-or-share-it" policy to prevent incumbent users from warehousing valuable spectrum resources if they are underutilized. Conceptually, use-it-or-share-it rules authorize opportunistic access to licensed spectrum that is locally unused or underutilized. Until the spectrum is actually put into service in a local area it should be available for non-interfering use by networks and devices. Licensees lose no rights whatsoever.

In the description of spectrum uses, in the "Wireless (fixed and mobile) broadband, including 5G" section there is a description of different wireless broadband use cases, the third category of wireless broadband covers business enterprise services operated by private entities within the confines of their own premises or land estate—for example, a hospital, education precinct or an industrial or transport facility.

The DSA would like to insist on the fact that unlicensed spectrum will be important for 5G. We would like to highlight that the use cases that are described in this section could be accomplished by license-exempt type networks like Wi-Fi 6E, which should be a key driver of change to existing spectrum arrangements. It would be important for ACMA to define a sharing framework in the 6 GHz band to support its deployment, recognize the need to accommodate broader channel bandwidths and the benefits for the millions of Wi-Fi users.

So, about alternative proposals for priorities, the DSA believes that the 6 GHz band should be included in the plan to study the coexistence conditions with the incumbent services in the band and to enable Wi-Fi 6E and wireless devices under a license exempt framework. TVWS technologies should definitively be included in the planning considerations of the ACMA, they can offer long-range, affordable connectivity especially for rural locations. Licence-exempt broadband services in TVWS are already up and running, regulatory frameworks are in place, the technology is proven, standards exist, radios have been certified, and commercial deployments are underway.

Finally, the ACMA should also consider flexible, shared use of E-Band to support coexistence of terrestrial, non-terrestrial, and hybrid point-to-point networks. By incorporating temporospatial modelling into self-coordination frameworks, the ACMA can support sharing between existing and emerging users of the band regardless of platform or service (e.g., terrestrial fixed point-to-point, HAPS, and NGSO satellites). Adopting dynamic spectrum sharing in E-Band will promote the seamless integration of innovative non-terrestrial backhaul networks to support 5G, IoT, and rural broadband connectivity.

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3. Are there other technology developments or sources of spectrum demand that the ACMA should be aware of in considering spectrum management over the next five years?

In Part I of the Five-year spectrum outlook the consultation, the ACMA indicates that the Authority monitors developments in radiocommunications technology, including equipment availability, that influence how spectrum is used. The DSA agrees on this premise and too on the fact that "two important influences on future demand for spectrum are technology developments that create new use cases and have potential to improve spectrum utilisation and efficiency, and international cooperation on the use of scarce spectrum and orbital resources".

In the case of international cooperation, it is widely recognized that spectrum management harmonization enables economies of scale that at the end represent huge benefits for the end-users. Spectrum harmonization is applicable to different technologies independently of the licensed scheme that is applicable and possible the best example of global harmonization is the Wi-Fi technology that is used by billions of people globally. Furthermore, the Wi-Fi industry is also constantly evolving, improving the spectrum efficiency and enabling new cases.

In the FYSO document, the ACMA recognizes that unlicensed spectrum access, implemented in Australia through the Low Interference Potencial Devices (LIPD) class licence has brought flexibility, and that the absence of licensing fees, has enabled massive innovation both in technology use and deployment approaches. As indicated by the ACMA, "there is no greater example of this than the 2.4 GHz (2400–2483.5 MHz) and 5 GHz (various parts of 5150–5875 MHz) bands that are class licensed and used for radio local area networks (RLANs)—especially wi-fi. Wi-fi devices now carry approximately half of all global Internet Protocol (IP) traffic[5], with wi-fi networks almost ubiquitous in homes and businesses along with many public spaces."

As it is the case with other technologies, Wi-Fi also requires more spectrum to provide the throughputs that users are requiring and that continue to increase[6]. The DSA disagrees with the ACMA when indicating that congestion events are anecdotal reports[7], we are convinced that the millions of Wi-Fi users in Australia will continue requesting more and more thought and the ACMA should immediately consider some actions to overcome that request. One of the main advantages of the additional spectrum requirements for this industry is that it doesn't require to clean bands and migrate existing users, which could be extremely costly processes, but it can coexist with existing incumbent services so they can continue to thrive in the 6 GHz band.

The DSA proposes ACMA to consider the appropriate framework to allow license-exempt access in the additional 1200 MHz of spectrum in the 6 GHz band (5.95-7.125 GHz). It was recognized in the document that, in the US, the FCC has recently made rules in the 5925–7125 MHz band that would support wi-fi use.[8] This decision enabled a large range of indoor and outdoor arrangements and different power levels permitted in different

[5] Cisco, 2016, accessed 27 April 2020, <http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.pdf>, pp. 24–25.
[6] References to the different Studies
[7] Page 35 of the report.
[8] FCC, 2020, accessed 27 April 2020, <https://docs.fcc.gov/public/attachments/DOC-363490A1.pdf>.

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segments of that band. A large ecosystem is growing for the different operating classes devices, that include Very Low Power (VLP), Low Power Indoor (LPI) and Standard Power (SP) devices.

Very low power portable Wi-Fi usages are for example mobile AR/VR, UHD video streaming, high speed tethering and in-vehicle entertainment. Wi-Fi 6 indoor use cases include residential Multi-AP / mesh networks, multiple dwelling unit (MDU), single-AP networks, high-density enterprise networks, indoor public venues and industrial IoT. Finally, Standard Power use cases allow gigabit class networks to be deployed in rural and suburban environments. In this operating class (SP), to manage interference with incumbent services in the 5.925-6.425 GHz and 6.525-6.875 GHz sub-bands, the FCC has proposed the use of an automated frequency control (AFC) system that would coordinate outdoor deployments to insure no interference with tens of thousands of point-to-point microwave links and other incumbents.

The ACMA indicates that "internationally, both the microwave fixed link and satellite industry have expressed concerns about these proposals. We will monitor the progress of this issue—particularly the matter of coexistence between possible wi-fi and similar uses of the band with other uses, such as satellite uplinks and fixed links." The DSA was part of the whole regulatory process in the U.S. for this band and had the opportunity to witness how the FCC considered the different technical arguments from the different interested parties before adopting the rules. We are confident that the adopted license-exempt framework won't affect the operations of the incumbents, as opposite to other proposals that were submitted to the FCC for licensed operations in the band, and would like to encourage the ACMA to include the analysis of this band for unlicensed access as a priority of the plan.

In Figure 1, the ACMA depicts the four stages in spectrum management band planning. As mentioned before, we think that the 6 GHz band planning shouldn't be at the *monitoring* stage, but an initial investigation about how to provide unlicensed access should be started immediately. The benefits of this band for the millions of Wi-Fi users and its benefits for the 5G ecosystem should be a reason to start working on it during the 2020, so a final framework could be expected in 2021.

4. Do you have any other feedback on the ACMA's plans for monitoring, initial investigation, preliminary replanning or replanning of bands?

The 3700–4200 MHz band has been included for initial investigation: "Use of the 3700–4200 MHz band has been debated internationally for several years. Recently, there has been increasing interest in the lower and lower-adjacent parts of this band for 5G services, particularly given the large bandwidths potentially available in this range. The ACMA is alert to the needs of existing fixed satellite and point-to-point uses of the band, as well as the potential for both wide-area and site-based—for example, FWA—wireless broadband. Considering the whole band simultaneously will maximise the opportunity for balanced approaches that take appropriate account of all interests". The 3700–4200 MHz band is allocated on a co-primary basis in the ARSP to the fixed, fixed-satellite (space-to-earth) and mobile services, and the DSA considers that spectrum sharing in this band could be considered by the ACMA. In this band, the use of databases would be useful to coordinate more intensive and efficient spectrum sharing. Regulators in a number of countries have authorized automated and even dynamic

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frequency coordination databases to manage real-time assignments in shared bands and to protect incumbent operations (including military and public safety systems) from harmful interference. Database technologies are widely available, sufficiently mature, scalable and secure[9] and the ACMA should consider them as an additional spectrum management tool.

[9] http://dynamicspectrumalliance.org/wp-content/uploads/2019/03/DSA_DB-Report_Final_03122019.pdf