Cambium Networks

24-30 GHz Spectrum Use in NZ
Discussion paper
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1 EXECUTIVE SUMMARY

The Cambium Networks team covering Australian, New Zealand and the Pacific Islands, appreciates the opportunity to submit a response to the *Discussion document, 24-30GHz use in New Zealand*.

Cambium Networks, is a leading global vendor of Fixed Wireless products, that supplies Point to Multipoint and Point to Point products that support the 900MHz, 2.4GHz, 3.3 GHz to 3.8, 4.9 GHz to 5.9GHz and 60GHz for Broadband Wireless Access (BWA), 6-38 GHz for PTP Fixed Microwave band, narrowband IoT SCADA solutions and Cloud Managed Wi-Fi and Ethernet switches.

Cambium Networks continues innovate and some years ago, identified the 26 GHz and 28GHz bands (24.25 GHz to 29.5 GHz) as bands suitable for Fixed Wireless solutions. Over the past two years Cambium Networks has developed a 5G Fixed Wireless Solution for these bands called cnWave28. Our cnWave28 solution supports an ultra-wide band, extending from 24.25 GHz to 29.5 GHz. The product is in advanced stages of development and we are targeting Q3 2021 for first product shipments. Whilst Cambium Networks recognizes the 26 GHz band as a pioneer 5G band, the 28 GHz has also emerged as another equally important band for FWA along with parts of the 24.25GHz to 26GHz band.

We would welcome the establishment of a license arrangements for wireless broadband (FWA), across all parts the 24.25 - 29.5GHz band.

Our response to this Discussion document is based on our knowledge and experience gained over the past 10 years working with network operators and enterprise customers building networks, delivering Fixed Point to Multipoint and PTP BWA services. We have seen the significant and positive impact that those services have had. We have also actively promoted the importance, availability and use of licensed and well as class licensed spectrum; and the use of Fixed Wireless network architectures to deliver broadband services to underserved areas as well as providing reliable connectively for mission critical industrial applications. Our response is hence based on our domain knowledge of the industry in Australia, New Zealand and on a global basis, and specifically Fixed Wireless technology and how it can be effectively used to connect the unconnected – people, places and things.

2 INTRODUCTION

2.1 INTRODUCTION TO CAMBIUM NETWORKS

At Cambium Networks, we support the communications of life for millions of people around the world and connect enterprise networks where other options cannot. No matter what the conditions or locations, wherever people or networks need to be connected, our wireless broadband solutions deliver clear voice, data and video communications people and networks can rely on.

Our Mission is Connecting the Unconnected and delivering solutions and technology that Bridge the Digital Divide.

Cambium Networks provides professional grade fixed wireless broadband, microwave, narrowband IoT and more recently Wi-Fi solutions. Our solutions are deployed in thousands of networks in over 150 countries, with our innovative technologies providing reliable, secure, cost-effective connectivity that's easy to deploy and proven to deliver outstanding performance metrics. To date Cambium Networks has delivered over eight million radio devices, a count that continues to accelerate year-over-year.

Cambium Networks are proven, respected leaders in the wireless broadband industry. We design, deploy and deliver innovative data, voice, and video connectivity solutions, through a qualified channel of distributors, Wireless Internet Service Providers, Telecommunications Companies, Value Added Resellers and System Integrators. Our solutions enable and ensure the communications of life, empowering personal, commercial, and community growth virtually everywhere in the world.

Following ten-years as a business unit within Motorola Solutions, Inc. Cambium Networks was established in 2011 following divesture from Motorola Solutions.

2.2 WHAT IS FIXED WIRELESS?

Key to understanding the value of Fixed Wireless, is understanding how it is different from and should not be confused with Mobile Broadband (MBB).

Mobile Broadband is synonymous with the networks that support mobile UE and are designed and built with that in mind.

Whilst similar in many respects, our Fixed Wireless broadband solutions, are optimised to provide the best results for delivery of fixed data services using harmonized RF bands. The typical application for Fixed Wireless is to provide a fixed data service using RF, when the use of fiber or copper are not possible, suitable, available or affordable.

3 RESPONSE TO QUESTIONS SPECIFIC TO OPTIONS PRESENTED.

Q1. What are the most likely use cases in New Zealand for mmWave based 5G services?

Since we would be aligned with 3GPP standards and optimized for TDD operation, the use case will be predominantly fixed wireless access for the last mile. We foresee excellent applicability for fixed wireless access (FWA) services which refers to smaller, local area subscriber services such as those provided by wireless internet service providers (WISPs) or other dedicated (for example, mining, local government) wireless (generally fixed) broadband networks. The technologies would be either Fixed Point-to-Point or Point-to-Multipoint and provide for higher capacity. Low latency services. These would be typically deployed under line-of-sight conditions.

Q2. What are the likely use cases for Ka band satellite services in New Zealand in the short and long term?

Ka band satellite services would continue to have relevance where Fixed Wireless PTP or PMP wireless cannot provide connectivity.

Q3. What are the spectrum requirements for ESIM use in New Zealand?

N/A.

Q4. Do you think the existing fixed service licenses in 26 GHz can be migrated to the 23 and/or 38 GHz fixed service bands?

In reference to Fixed Point to Point services, We believe that there should be a period of coexistence in line for a period of up to 7 years. There should be coordination requirements to protect legacy point to point links. Oxygen absorption in 23 GHz is significantly higher than 26 GHz and therefore may not be a suitable migration. 38 GHz could be a suitable migration path.

Q5. If not, do you think the existing fixed services should be allowed in the 26 GHz?

We believe that there should be a period of coexistence in line for a period of up to 7 years. During this time, coordination requirements should be set to provide incumbents protection.

Q6. Do you agree New Zealand should allocate 24.25 - 27.5 GHz primarily for IMT use?

We agree to this as long as there is sufficient allocation to provide a framework within this for Fixed Wireless Broadband as recognized in IMT-2020.

Q7. How should RSM accommodate other use in this band such as space services?

N/A.

Q8. How do you see our proposal of the 28 GHz band allocation?

The proposal to allocate the entire 28 GHz band for satellite is not preferred. There must be recognition that Fixed Wireless Access services provide greater capacities, lower latencies and faster roll-out of service than satellite. However, there is still also significant requirement for satellite services where FWA cannot reach. The 2 technologies in this case can certainly work together to provide complementary solutions as is currently done in many parts of the Pacific and Rural/Regional Australia.

Q9. Which option do you prefer for allocating 28 GHz band? Or is there any other option for managing the shared use of IMT, ESIMs and FSS in the 28 GHz band?

Q10. If you prefer option 1, do you agree with the proposed sharing mechanism (defining satellite coordination zones) between IMT use and FSS ground stations?

N/A.

Q11. If you prefer option 2, how much spectrum do you think RSM should allocate to ESIM, IMT private network/FWA? And what's the preferred spectrum placement?

Q12. Are there any other issues of sharing use between satellite earth stations and ESIMs that you would like to bring to our attention?

N/A.

Q13. Do you agree that the current satellite allocation and licensing regime for 29.5 – 30 GHz should remain?

N/A.

Q14. What's your preferred licensing option in 26/28 GHz spectrum?

Our preferred licensing option would be Option 2 Regional Rights.

Q15. Do you see any need for general user license spectrum for IMT? If so, what use case might there be?

N/A.

Q16. If there is a need for general use spectrum for IMT and ESIM, how much spectrum should we set aside for it? Should RSM mandate technical conditions on the general use license?

N/A.

Q17. Do you agree RSM should adopt 3GPP NR FR2 based channel bandwidth to design a channel plan in the radio licence regime for IMT services?

Yes, we agree it should.

Q18. Do you agree RSM should refer to 3GPP standards to set the regulatory requirements for spectrum allocated to IMT?

Yes, we agree it should.

Q19. Should we introduce a break point for MR technical conditions mid-way through the duration of the MR? Or is it sufficient to set AFELs based on current technology and standards only?

Would need more time on this to provide a reasonable comment.

Q20. Do you agree RSM should mandate equivalent ETSI harmonised standards for radio licenses in Radio Standards Notices and review these standards regularly?

Yes, we agree RSM should mandate equivalent ETSI harmonized standards.

Q21. Which option do you prefer to set the unwanted emissions?

We would prefer using Total Radiated Power to set the unwanted emissions.

Q22. If we use a TRP option for setting AFEL and UEL, do you have any recommended solutions on TRP measurement in field?

Would need more time on this to provide a reasonable comment.

This is potential complex and would require further investigation for reasonable comment.

Q23. Do you agree that RSM should set unwanted emissions limits (in UELs and AFELs) base on 3GPP category B requirements? If no, please explain the reasons and provide your suggestions?

Would need more time on this to provide a reasonable comment.

This is potential complex and would require further investigation for reasonable comment.

Q24. Do you agree that we should we implement (e.g. through UELs and AFELs) the ITU Radio Regulations, Resolution 750 limits, including the 1 September 2027 transition date and grandfathering clause for the protection of the EESS (Passive) Band? If not, please explain what limits and transition dates you consider to be more appropriate.

N/A.

Q25. Do you have any insights on equipment availability at, or close to, the edge of 24.25 GHz that can meet both pre-1 September 2027 and post-1 September 2027 unwanted emission limits? Is there any additional technical solution such as frequency separation or filtering required for some equipment types?

N/A.

Q26. Do you agree with RSM's position to not establish a framework for coordination zones for RAS?

N/A.

Q27. Do you see a need for RSM to allow EESS and SRS earth stations to operate in the band?

N/A.

Q28. Do you agree a semi-synchronised or unsynchronised network should be used in 5G high band deployment?

Semi-synchronised networks would provide the best spectrum efficiency and thus are the preferred solution.

Q29. If the network is unsynchronised, what is the best way to manage the interference between unsynchronised operators?

N/A

Q30. If your preference is a semi-synchronised network, what is your suggestion on setting the synchronized parameter?

N/A

Q31. Do you agree that think RSM should implement ITU Radio Regulations, Resolution 242, resolves 2.1 in the management rights and licences conditions? If not please explain why or propose an alternative?

Yes we agree with this.

Q32. Do you see a need for RSM to allow continued FSS gateway access to 27.0 - 27.5 GHz on a case by case basis? If so, how should we coordinate FSS Earth stations and IMT?

N/A.

Q33. Do you have any comments regarding the spectrum sharing approach proposed by RSM between FSS and IMT FWA in the 28 GHz band?

No comment.

Q34. If RSM were to apply an EIRP limit on horizontal plane for FSS, what is the maximum EIRP value we should assume?

N/A.

Q35. Which option do you prefer for arranging the existing fixed service in the 26 GHz band?

For a fixed wireless vendor, it would be more appropriate to consider Option 2 where there service is maintained through arrangement/negotiation.

Q36. Do you think RSM should mandate the regulatory requirements as laid out in Resolution 169 (WRC-19) for ESIM use if a shared use between 27.5 – 28.35 GHz?

N/A.