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3 May 2024

The Manager
Spectrum Licensing Policy Section
Australian Communications and Media Authority
PO Box 13112 Law Courts
Melbourne VIC 8010

Five-year spectrum outlook 2024–29 and 2024–25 work program

Dear Sir/Madam,

The GSMA appreciates the opportunity to respond to this consultation by the Australian Communications and Media Authority (ACMA) on the Five-year spectrum outlook 2024–29 and 2024-25 work program.

The GSMA is a global organisation uniting more than 750 operators and almost 400 companies in the broader mobile ecosystem and related industries. Our vision is to unlock the full power of connectivity so that people, industry and society thrive.

Our submission is attached below. Should you have any further query, please do not hesitate to contact me at [REDACTED].

Yours sincerely,

A large black rectangular box redacting the signature of Jeanette Whyte.

Jeanette Whyte
Head of Public Policy, APAC
GSMA

GSMA's submission to Five-year spectrum outlook 2024–29 and 2024–25 work program

Introduction

Australia is among the most advanced countries globally in terms of mobile connectivity, evidenced by the widespread availability and adoption of high-quality mobile services supported by the scale of its 5G rollout. In this regard, we commend the ACMA's long-running and exemplary Five-year spectrum outlook (FYSO) planning process which has facilitated the successful rollout of 4G and 5G networks in Australia.

In the 5G era, mobile networks require predictable access to spectrum in low, mid- and high bands. Predictability is the result of national broadband plans and clear, long-term spectrum roadmaps. The timely release of key IMT bands, including 3.6 GHz, 26 GHz and most recently 3.4/3.7 GHz, has provided Australian mobile operators with a good foundation to address the needs of enhanced mobile broadband, as well as those of the fast growing 5G enterprise sector and the associated ultra-reliable low-latency services and massive IoT applications.

The commercialisation of 5G continues to gather pace around the world. By 2029 over half of total mobile connections globally will be on 5G while in Australia the proportion of 5G connections will be close to 90%.¹ Thus, as 5G technology matures and demand continue to grow towards the end of this decade, it is crucial that the ACMA continues to support mobile operators' ability to invest and innovate by ensuring adequate supply of IMT spectrum over the 2024-2029 period.

The GSMA appreciates the opportunity to provide our views on the ACMA's draft Five-year spectrum outlook 2024–29 and 2024-25 work program. Below we provide a brief overview of the outcomes from WRC-23, followed a discussion of the need for additional mid-band spectrum for licensed mobile and the optimal allocation of the 6 GHz band.

WRC-23 outcomes

At World Radiocommunication Conference 2023 (WRC-23) important decisions were made on mobile allocation and IMT identification of low-band spectrum (below 1 GHz) and mid-band spectrum in the 3.5 GHz and 6 GHz ranges. The results provide a clear roadmap for the mobile sector and pave the way for additional capacity to support continued innovation in the mobile sector through 5G-Advanced and future technology generations. Specifically,

- **Expansion of mid-band spectrum in 6 GHz band.** One of the significant outcomes of WRC-23 was the identification of additional mid-band spectrum to meet the growing demand for mobile data. The upper 6 GHz band (6.425-7.125 GHz) was identified for mobile use by countries in every ITU Region – EMEA, the Americas, and the Asia Pacific.² This band, supported by countries representing over 60% of the world's population, is now the harmonised home for expanding mobile capacity for 5G-Advanced and future technologies.

¹ Source: GSMA Intelligence

² The 7025-7125 MHz band has been identified for IMT across Region 3 (Asia Pacific). For 6425-7025 MHz range, three Region 3 countries (Cambodia, Lao PDR, Maldives) have identified this range for IMT at WRC-23 and there was also strong interest from other countries, including Bangladesh, China, Indonesia, Myanmar, Sri Lanka, Thailand and Vietnam, which have indicated their intention to identify this frequency range for IMT at WRC-27 in line with Resolution 256 (WRC-23).

- **Final harmonisation of the 3.5 GHz band.** The 3.5 GHz (3.3-3.8 GHz) range, recognised as the pioneer 5G band, has been further harmonised across Europe, the Middle East and Africa (EMEA) and the Americas. Spectrum harmonisation is crucial to achieving economies of scale and facilitating the growth of mobile connectivity. This band is already being used extensively in Australia and the Asia Pacific region, and broader harmonisation will bring maximise the benefits from 3.5 GHz for 5G.
- **Fostering digital equality through low-band spectrum.** WRC-23 took a step towards greater digital equality by defining the mobile use of more low-band spectrum in the 470-694 MHz band in EMEA. Low bands play a crucial role in expanding capacity for internet connectivity in rural communities, as their signals cover wider areas. Additional availability of low-band spectrum will help address the urban-rural connectivity divide, breaking down barriers toward digital inequality.³

Figure 1: WRC-23 results for IMT

6 GHz	3.5 GHz	Low Bands
<ul style="list-style-type: none"> ✓ IMT throughout EMEA and CIS in 6.425-7.125 GHz ✓ IMT footnotes for APAC and Americas ✓ Footprint expansion in 2027 ✓ 60% of global population covered by countries supporting 6 GHz IMT ✓ 700 MHz of new IMT capacity in 6 GHz band 	<ul style="list-style-type: none"> ✓ Harmonisation throughout EMEA, CIS and the Americas within 3.3-3.4 and 3.6-3.8 GHz ✓ 400 MHz+ harmonised spectrum in nearly all countries ✓ Harmonisation of 3.5 GHz completed in over 150 countries 	<ul style="list-style-type: none"> ✓ IMT throughout Middle East in 600 MHz ✓ Mobile allocation in 470-694 MHz in Europe ✓ 600 MHz foothold in some African countries ✓ 60+ countries signed into new footnotes for low-band spectrum

WRC-23 marks a significant milestone in the evolution of mobile communications. The next steps for policymakers and regulators will be to implement WRC-23 decisions and results in their national tables of allocations in a timely manner to support spectrum harmonisation and avoid interference issues.

Upper 6 GHz spectrum and mobile networks

Mid-band spectrum in the 1-7 GHz range is vital to delivering consistent 5G user speeds for consumers, schools, and businesses across connected cities. The GSMA estimates that 2 GHz of mid-band spectrum on average will be required per market to support the growth of 5G by 2030.⁴ Today, around 650-750 MHz of mobile spectrum is typically available in the 1-3 GHz range. In the more mature 5G markets, 400-500 MHz of 3.5 GHz spectrum usually supports city-wide 5G, giving a total of around 1150 MHz as indicated in Figure 2.⁵

In many markets however, the amount of mid-band assignments are lower. For example, in Australia there is currently around 840 MHz of mid-band spectrum assigned to mobile operators⁶ – a significant shortfall to the 2 GHz required. The upper 6 GHz band is essential to bridge this gap.

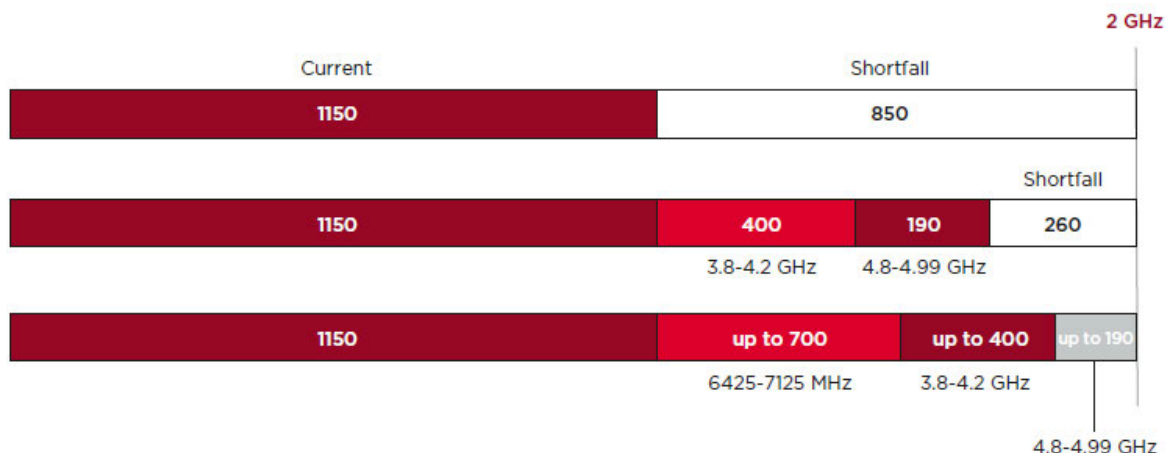
³ In the Asia Pacific region, there is already interest in the 600 MHz band for IMT among several countries including India, New Zealand and Vietnam.

⁴ [GSMA. Vision 2030: Insights for Mid-band Spectrum Needs. July 2021.](#)

⁵ [GSMA. The Maths of Mid-band Spectrum, 20 July 2022.](#)

⁶ Comprising 1800 MHz, 2.1 GHz, 2.3 GHz, 2.6 GHz and 3.5 GHz, noting there are regional differences across Australia.

Figure 2: Options to address mid-band spectrum needs by 2030



As 5G evolves into 5G-Advanced and network quality continues to improve throughout the decade, traffic volume will follow. By 2029 close to 90% of mobile connections in Australia will be on 5G and that is when demand and the economic impact on businesses, economies, and livelihoods will be at its highest.

The primary use of upper 6 GHz spectrum for mobile networks will be to provide capacity and performance for 5G on a city-wide basis. This will involve re-use of existing base station sites that are already using spectrum in the 3.5 GHz band to provide 5G services across urban areas. Mid-band spectrum provides a unique combination of capacity and coverage for wide-area services, and widespread use of macro-cellular base stations is needed in order to take advantage of this.

The upper 6 GHz spectrum is able to achieve a similar level of coverage to the 3.5 GHz band. Hence, mobile network operators will be able to expand their 5G networks in a practical, cost-effective and environmentally-friendly way by adding additional base station transmitters using upper 6 GHz spectrum to existing 5G macro sites that use spectrum in the 3.5 GHz band. Trials involving the upper 6 GHz band for mobile have demonstrated that 6 GHz outdoor cells can provide indoor coverage with significant data rates.⁷

Operator investment in every new frequency layer is vast – both in the acquisition of spectrum and subsequent network upgrades – and finding the right spectrum assets is important. Large channel sizes are paramount for 5G and, with the possibility of new mid-band spectrum assets being considered for 6G in some markets towards the end of this decade, will become even more so in the future. The upper 6 GHz band will be crucial for the next phase of growth and development for the mobile industry.

Optimal allocation of the 6 GHz band

There are competing claims for use of the 6 GHz band (5925-7125 MHz) for IMT and Wi-Fi and the specific use of this band has clear implications on the socio-economic benefits that 5G can deliver. Thus, it is essential for policymakers and regulators to carefully consider the implications of the allocation of this band.

⁷ [APT Report on trends and spectrum developments for IMT usage in 2025-2030 in Asia Pacific region. APT/AWG/REP-136, March 2024.](#) See Section 3.4.

A detailed economic impact assessment by GSMA Intelligence⁸ of the different allocation scenarios for the 6 GHz band in 24 countries, including Australia, found that optimal socio-economic benefits are achieved from the allocation of at least 700 MHz of the 6 GHz band for licensed 5G use. Even in countries with extensive fibre broadband penetration, the allocation of an additional 500 MHz of spectrum for unlicensed use in the lower 6 GHz band (5925-6425 MHz), representing roughly a doubling of the current supply of licence-exempt spectrum, will be sufficient to address expected Wi-Fi demand.

Given the ACMA's decision to make available the lower 6 GHz band for RLANs including Wi-Fi, allocating the upper 6 GHz band for licensed mobile use is the most productive option. Further allocation for unlicensed use in the upper 6 GHz band would be sub-optimal from the perspective of maximising the social and economic value of spectrum.

We note the ACMA is considering possible “hybrid” sharing options in the upper 6 GHz band. While the GSMA recognises the ACMA's objective to promote efficient use of spectrum through sharing between IMT and Wi-Fi services, fundamental differences between the protocols used in mobile networks and Wi-Fi make it very challenging in practice to achieve effective sharing between the two types of systems, in the same frequency band and adjoining/overlapping geographic areas, without significantly compromising the performance of one or both of the systems.

Such approaches pose significant risks to the ability of mobile network operators to make the full use of the upper 6 GHz band, reducing the benefits that can be delivered through licensed use for wide-area capacity expansion. Careful examination of the benefits and costs associated with hybrid sharing options in the upper 6 GHz band will need to be conducted before any decision is taken.

Conclusion

Australia has made a strong start to the 5G era. However, as 5G evolves and demand grows over the rest of this decade, additional mid-band spectrum supply needs to be made available to enable sustainable capacity expansion for 5G-Advanced and future technologies. The outcomes of WRC-23, specifically the identification of the upper 6 GHz band for IMT use by countries across all three ITU regions, confirms that the upper 6 GHz band is the most viable spectrum to address future needs for the mobile industry.

The GSMA firmly believes that a balanced approach to the allocation of the 6 GHz band, comprising lower 6 GHz for unlicensed use and upper 6 GHz for licensed IMT services, represents the optimal approach for Australia to secure maximum socio-economic benefits.

Mobile operators require predictable access to spectrum in order to make long-term investments to meet growing demand. The ACMA can help provide this certainty by ensuring the full availability of the 6425-7125 MHz band for licensed mobile use in Australia through the FYSO 2024-29 planning process.

We trust that our submission will merit your kind consideration and we remain available for any questions and further information or clarifications.

⁸ [GSMA Intelligence. The socioeconomic benefits of the 6 GHz band: considering licensed and unlicensed options, June 2022.](#)