



AUSTRALIA

Submission by Free TV Australia

**Five-year spectrum
outlook 2021-2026**

**Australian
Communications and
Media Authority**

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1. Executive Summary

- Free TV welcomes the opportunity to provide a submission to the Australian Communications and Media Authority (ACMA) on the draft Five-Year Spectrum Outlook for 2021-2026. Our members are spectrum users in a number of different bands discussed in the FYSO consultation draft.
- A key issue raised for Free TV members in the draft FYSO is the commercial broadcasting tax. Free TV highlights the critical need to bring the commercial broadcasting tax in line with international best practice, with the tax currently being 52 times higher than in the USA.
- The consultation on the draft FYSO is occurring at the same time as the Government is consulting on a media reform Green Paper, which has the potential to have significant implications for the 600 MHz band.
- Free TV recognises that the ACMA’s placement of the 600 MHz band in the “initial investigation” category is necessary in the context of the Government’s Green Paper.
- Free TV will be providing the Government with a comprehensive response to the Green Paper. In preparing this response, several areas for further analysis have been identified that should form part of the ACMA’s initial investigation work.
- In particular, these are:
 - In-band and out-of-band emissions from 5G network architecture that will likely deploy mobile base stations in the channels adjacent to broadcasting services—increasing the severity of interference
 - the impact on wireless microphone class licence users in the existing 600MHz band
 - the appropriate planning criteria to be included in revised Technical Planning Guidelines to be used in preparation for any potential restack process
 - research on domestic consumer reception arrangements, including the market penetration of receivers that are MPEG-4 and DVB-T2 capable to assist the industry and Government assess any transition options.
- Finally, Free TV notes that the ACMA’s work program over the next 12 months includes the implementation of the spectrum pricing guidelines, which will involve further consultation on matters such as the pricing of fixed links that are critical to the delivery of broadcast services.
- Free TV and its members look forward to working with the ACMA on these matters over the coming year.

2. Introduction

Free TV Australia is the peak industry body for Australia's commercial free-to-air broadcasters. We advance the interests of our members in national policy debates, position the industry for the future in technology and innovation and highlight the important contribution commercial free-to-air television makes to Australia's culture and economy.

Free TV proudly represents all of Australia's commercial free-to-air television broadcasters in metropolitan, regional and remote licence areas.



Our members are dedicated to supporting and advancing the important contribution commercial free-to-air television makes to Australia's culture and economy. Australia's commercial free-to-air broadcasters create jobs, provide trusted local news, tell Australian stories, give Australians a voice and nurture Australian talent.

A recent report by Deloitte Access Economics "*Everybody Gets It: The economic and social benefits of commercial television in Australia*" highlighted that in 2019, the commercial TV industry supported 16,300 full-time equivalent jobs and contributed a total of \$2.3 billion into the local economy. Further, advertising on commercial TV provided an additional \$4.4 billion worth of economic benefit.

In addition to this economic analysis, Deloitte also undertook a consumer survey that highlighted the ongoing importance of the commercial TV sector to the community, including finding that:

- 86% of people consider that commercial television supports Australian culture
- 76% of people consider commercial TV is more important than ever
- 95% believe that losing it would have an impact on society.

The commercial free-to-air broadcasting industry creates these benefits by delivering content across a wide range of genres. These include news and current affairs, sport, entertainment, lifestyle and Australian drama.

Television broadcasters in Australia are the main users of the frequency range 520-694MHz for TV broadcasting services and wireless microphones. In addition, television broadcasting uses radiofrequency spectrum beyond what is immediately apparent to the public. While the television transmissions to antennas on residential premises are clearly the primary application there are a wide range of other uses such as:

- Terrestrial feeder links for contribution of television program material from other sources
- Terrestrial feeder links as relays from television centres to outlying transmitters
- Wireless cameras used in electronic news gathering
- Sports and special event program content from outdoor venues
- Wireless microphones for sound recording
- Contribution of television program material from overseas sources via satellite
- Two-way radiocommunications.

3. Spectrum pricing

3.1 Commercial broadcasting spectrum tax

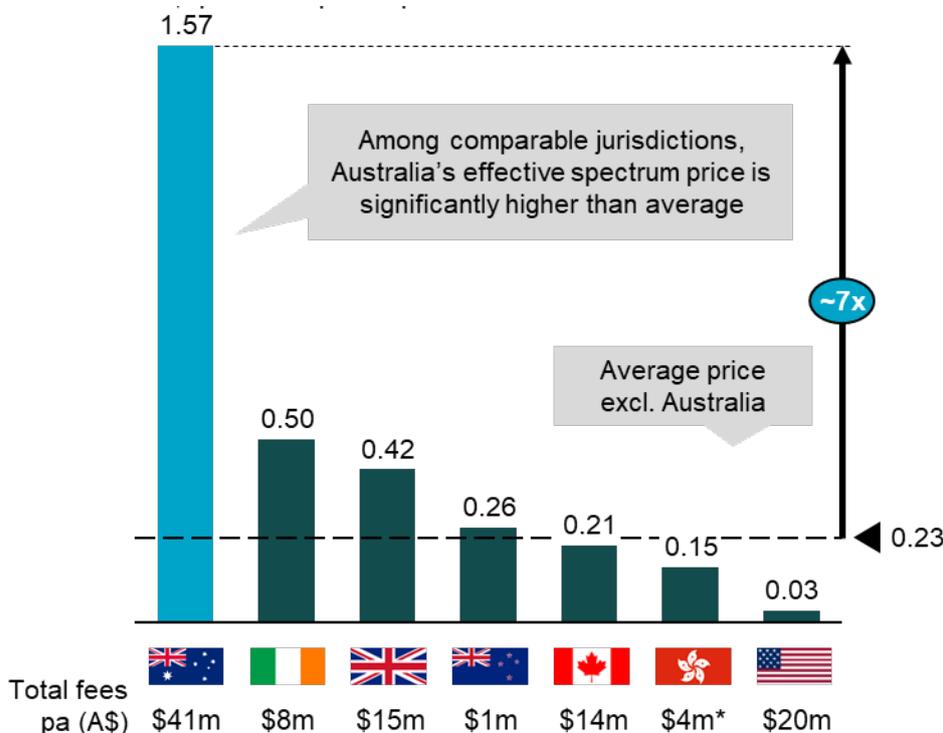
A key issue for Free TV members remains a review of the Commercial Broadcasting Tax (CBT). While the ACMA has provided a report to the Minister on the administrative improvements that could be made to the CBT, Free TV notes that a review of the level of the CBT has yet to be undertaken.

The Government introduced a five-year interim spectrum tax as part of the 2017 Media Reform Package, with a commitment to review the CBT stipulated in the accompanying legislation and highlighted in the Minister’s second reading speech.

Consistent with our previous submissions to the ACMA, we remain concerned that the limited examination of the CBT administrative arrangements undertaken by the ACMA was not the review anticipated by the legislation and extrinsic material.

The CBT represents a significant financial impost that is out of step with international best practice and there is a strong case for the spectrum charge to be significantly reduced. Work undertaken by Venture Consulting has revealed that the CBT is 52 times higher than equivalent per capita charges in the USA (see graph below). Consistent with international approaches, we submit that the aggregate amount of any tax levied should not exceed the ACMA costs of managing the spectrum allocated to broadcasting.

Broadcaster fees by country, A¢ per MHz-pop (FY19)



Source: Venture Consulting Analysis. * HK license fee calculated by estimating program hours by broadcaster and adding annual fee.

We are concerned that without a genuine review of the taxation arrangements, as anticipated by the legislation and supporting materials, there is no clear pathway for the proper consideration of appropriate taxation arrangements going forward. We submit that a full examination of the

appropriateness of the CBT, including international approaches to the level of taxation, is a critical piece of work that should be in the ACMA's future work program.

Further, arrangements to compensate regional television broadcasters for the disproportionate impact of the 2017 spectrum tax arrangements are due to expire in 2022. Without these measures, some regional broadcasters could be required to pay spectrum taxes in excess of pre-2017 broadcast licence fees.

3.2 Spectrum pricing guidelines implementation

Free TV welcomes the first round of changes to apparatus licences from the implementation of the Government's spectrum pricing review. In particular, we support the changes to the geographic weightings for 5GHz spectrum and above which has led to reductions in taxes for some licences.

We look forward to engaging with the ACMA as it publishes further papers in Q2 and Q3 in relation to the consistency of the pricing approach across different bands, geographic areas, and services apparatus licences, including in relation to the pricing of fixed links used to serve low density areas.

4. Broadcasting Services Band – 600MHz initial investigation work

4.1 Background

In previous spectrum outlooks the ACMA has maintained the 600 MHz band in the “monitoring” category, while acknowledging that in the US this spectrum had been allocated to IMT.

The stakeholder feedback to the ACMA on the 600 MHz band was generally supportive of this allocation. Submissions from the three mobile network operators to the draft FYSO 2020-2024 did not suggest any urgent need for reallocation of the 600 MHz band. Similarly, the submission from peak body AMTA highlighted that:

“The bands 600 MHz, 3.3 GHz, 4.5/4.8 GHz have been listed in the FYSO for several years, and AMTA accepts that they remain at the Monitoring stage due to existing use of the bands by incumbent broadcasters and the Department of Defence.” (p. 9)

“As such, we understand that the bands are unlikely to be progressed to auction in the near future, especially when there are alternative spectrum options. However, we support these bands remaining in the FYSO in particular due to the international developments noted by the ACMA in the FYSO.” (p. 9)

“Specifically, with respect to the 600 MHz band, we remain interested in the band as a mid-term future spectrum option. For completeness, we believe it’s worth noting the existing IMT identifications: including a number of Asia-Pacific nations including New Zealand (RR No. 5.296A), and in a number of American nations including Canada, USA and Mexico (RR. No. 5.308A). For this reason, we would like to see the 600 MHz band progress to Initial Investigation in the next revision of the FYSO (i.e. 2021-25), so that the ACMA and relevant industry stakeholders can begin to think about the issues involved in what will likely be a lengthy project.” (p. 9)

It is clear from these comments, that while the mobile operators supported the progression of the 600 MHz band into the initial investigation category, this was as a result of the likely lengthy nature of such a sensitive re-farming exercise, rather than any urgency in proceeding to reallocation.

However, with the release of the Government’s Media Reform Green Paper in late 2020, the ACMA has now moved the 600 MHz band to the initial investigation category, noting that:

“Media reform green paper developments will inform the initial investigation and scoping of options for possible domestic replanning of the band” (p. 23)

The draft FYSO appropriately recognises the planning and implementation challenges of any restack, importantly highlighting both the current uncertainty about the appropriate broadcasting technology and the potential for an impact on viewers:

“The consolidation of TV channels into the lower part of the band and reallocation of the spectrum would require different planning and implementation paths depending on broadcast technology and multiplex sharing scenarios. This would inform the timeframe and complexity of the restack implementation and impact on viewers.” (p. 31)

4.2 Initial investigation work program

4.2.1 Challenges of wireless broadband in 600MHz

The initial investigatory work by the ACMA should include consideration of the implications for TV reception of wireless broadband operating in 600 MHz spectrum.

In contrast to the 700MHz wireless broadband allocation, the emerging international 600 MHz wireless broadband allocation features a ‘reverse duplex’ configuration, meaning base stations will operate in the lower part of the band. This is illustrated by the following spectrum chart for 5G services now standardised by the FCC in North America and the ITU in Europe. Note the “reverse duplex” base station starts at 617MHz. In a scenario where TV services were ‘restacked’ to occupy the present TV channel Blocks A, B and C, adoption without a change to the FCC/ITU configuration would result in a guard band of only 7MHz between TV channels and mobile base stations.

Exhibit 1. Spectrum chart for 5G services in North America and Europe

600MHz Band					700MHz Band						
Reverse Duplex FDD					Conventional Duplex FDD						
Base Station Down Link	Mid Band Gap		User Equipment Up Link		User Equipment Up Link	Mid Band Gap		Base Station Down Link			
617	652	11Mhz		663	698	702	743	10MHz		761	802

The potential for interference to TV receivers and signal boosters from both in-band and out-of-band emissions from mobile telecommunications is a well-known issue from the first digital dividend, when 4G mobile services commenced in the neighbouring 700 MHz band. However, an early program of work is desirable to understand the extent to which the “reverse duplex” nature of 5G network architecture will worsen these problems and complicate the task of mitigating them.

In the case of 700 MHz, carriers use the lower part of the band (nearest to the broadcasting services bands) for low-power and usually transitory transmissions from mobile devices back to a base station. These signals rarely disrupt household TV viewing. The mobile base stations themselves are potentially much larger sources of interfering signals. However, as they use the upper part of the band – separated from TV by over 50 MHz – any interference problem is usually readily fixed by fitting an inexpensive filter at an appropriate place in the viewer’s antenna system and cabling.

A reverse duplex poses two challenges that should be further assessed by the ACMA in good time before government and industry make final decisions about repurposing 600MHz. The first is that many more households will experience interference from the much stronger signals coming from (elevated) 5G base stations, typically whenever a new base station is in the field of view of the household antenna. A sub-set of these households will face intractable interference, meaning they will need to obtain television from another source.

The second is that in order to be effective, any filter fitted to shield TV reception will need to be far more expensive, and potentially bulkier, than the simple filters used for 700 MHz carrier interference problems. The expense arises because filters vary in complexity depending on how ‘steeply’ they cut off reception of the unwanted signal. In the 700 MHz band, filters can be gently sloped, right across the 50 MHz separating TV from 4G base stations. By contrast, a 600 MHz filter, assuming the reverse duplex arrangement, would need to be far ‘steeper’ (and hence more expensive), since the unwanted signals might begin only 7 MHz away from the TV signals. Whether 7MHz is sufficient separation will also be an issue for the out-of-band emission and protection rules

developed for this band in Australia, which will need to take appropriate account of the reverse duplex problem.

The ACMA's future work program should include an investigation to scope out both the problem and the options for mitigation, prior to any 600 MHz reallocation. Specifically, work is needed to understand what kinds of filter products, and at what prices, industry can supply. We also recommend work to estimate the number of affected households.

4.2.2 Class licence users in the 600 MHz band

The ACMA initial investigation should also consider the issues associated with class licence users in the 600 MHz band. These users, such as wireless microphones and in-ear monitors, are currently class-licensed to operate in so-called 'white spaces' in the UHF broadcasting services bands.

Australian television broadcasters are just one of the user groups in Australia who have high usage of wireless microphones. Other users include the Australian radio broadcasting sector, film and television program production, music industry, advertising industry, public address systems in schools, to name a few.

Wireless microphones are classified as audio transmitters where the operation of the wireless microphones is permitted under the low interference potential devices (LIPD) class licence.

As the ACMA is aware, the LIPD class licence permits use as a short-range device on shared frequencies. The class licence is also on the basis that no interference is caused to other radiocommunications users, no protection is provided from interference for users operating under the licence and users must abide by any other limitations and requirements of the licence.

Any re-farming of 600 MHz and re-tuning of TV into 500 MHz may result in much less, and/or noisier, 'white space' spectrum suitable for low interference device operation. Especially in highly congested areas, such as the Gold Coast, this may affect the feasibility of using UHF 'white space' at all, or the operating range (and therefore the utility) of wireless mics.

While there are other bands already available for wireless mics, notably 1785-1800 MHz, inferior propagation of 1800 MHz spectrum makes it unsuitable as a direct replacement for some UHF equipment.

Further, Free TV has been advised that much of the current equipment will lack the re-tuning capability to move into any remaining available spectrum, so would need to be replaced. This is particularly problematic given many users have only recently refreshed their equipment following the 700 MHz re-farming process.

Similarly, class licence users may be unknown to the ACMA and unaware they are affected, so a suite of effective communications strategies will be required prior to any restack process. The need for effective communication starts immediately, as equipment retailers and users face an immediate 'crisis of confidence' about which parts of the current broadcast spectrum bands will be available for low interference devices in future.

Any decision to reallocate 600 MHz spectrum and restack TV services will be contingent on a plan to address the impact on low interference services.

4.2.3 Planning criteria to be used in any potential restack process

In the event of agreement between government and industry to any major replanning of the UHF TV bands, there will be a need for the ACMA to review the *Broadcasting Services (Technical Planning) Guidelines 2017* at the outset to ensure that they provide a sound basis for the work.

The Technical Planning Guidelines (TPGs) have been simplified in recent years and no longer contain the detailed planning methodologies and criteria which applied for the restack to below the 700MHz band and which would be necessary to plan for a future re-stack. For example, the planning for a restack of the existing digital services to below 610MHz will require development of parameters for frequency transmitter ERP and re-use distances of transmissions in UHF Band IV and V.

4.2.4 Research into the market penetration of next generation receiver equipment

A key issue to consider in relation to any transition path to next generation broadcast technologies is the market penetration of consumer television equipment that can receive and decode new transmission signals and picture formats.

Indeed, the fact that there is no available data on the size of the legacy receiver population has been a key stumbling block for the completion of the broadcast industry's ongoing transition to MPEG-4 and the discontinuation of MPEG-2 services. While it is likely that every new television receiver sold in Australia since 2015 is capable of decoding a MPEG-4 signal, it is not known how many households have either not refreshed their television set in this time, or have moved older sets to other rooms for use as a second or third receiver.

It will be important for both industry and Government to have accurate data on which to base any plan for future migration. To this end, the ACMA could assist the process by undertaking research on domestic consumer reception arrangements. The industry would welcome the opportunity to work with the ACMA on how such a household survey could be undertaken to assess the market penetration of receivers that are MPEG-4 and DVB-T2 capable to assist the industry and Government assess any transition options.

4.2.5 Potential for increased co-channel interference

As the ACMA is aware, co-channel interference is a problem that exists today with the current spectrum planning and channel allocation.

This interference manifests in two different ways. The first is sporadic, often seasonal, interference directly to viewer receivers resulting from 'ducting' of distant, co-channelled TV services into viewer antennas. It often affects peak-time viewing and can become an intractable political issue. The second occurs when the interference affects the in-band links or off-air feeds broadcasters use to distribute programming from 'parent' to 'child' transmitters. When this happens, everyone viewing the downstream transmissions will experience the disruption.

The spectrum planning expertise of the ACMA will be crucial in assisting the Government assess the potential for increased interference and the loss of reception for viewers under various planning scenarios. This analysis should include the impact of the increased propagation from the increased use of 500 MHz spectrum and the pre-existing locations of transmission sites and their associated off-air feeds and in-band links.