

AMTA

Supplementary Submission to ACMA:
'Beyond 2020 – A spectrum management strategy to address the growth in mobile broadband capacity'



Introduction

AMTA appreciates the opportunity to provide a supplementary update to its 30 October 2015 submission made in response to the ACMA's discussion paper *Beyond 2020 – A spectrum management strategy to address the growth in mobile broadband capacity* (the Discussion Paper).

The conclusion of the 2015 World Radiocommunication Conference (WRC-15) has assisted to clarify several issues regarding the international harmonisation of frequency bands for use by mobile broadband services. It is therefore timely to reflect on the impact of these latest developments on AMTA's views and provide the ACMA with updated views in this submission, to assist the ACMA in finalising its Mobile Broadband Strategy and Work Program (MBB Strategy) to be released in early 2016.

AMTA understands that the ACMA's MBB Strategy will continue to be developed by the ACMA in consultation with stakeholders and we welcome continued consultation on the MBB Strategy, noting that we are still forming our views on some matters, such as the review of the 803-960 MHz band.

Overview of developments

WRC-15

WRC-15 Agenda item 1.1

The purpose of WRC-15 Agenda item 1.1 was to:

“consider additional spectrum allocations to the mobile service on a primary basis and identification of additional frequency bands for International Mobile Telecommunications (IMT) and related regulatory provisions, to facilitate the development of terrestrial mobile broadband applications”.

AMTA's initial submission noted that identification of a band for IMT does not mandate use of that band in Australia, nor is it a prerequisite for a band's use for mobile broadband in Australia. Rather, the purpose of identification of a band is to promote widespread international harmonisation and the consequential benefits.

In this sense, the main objective of WRC-15 Agenda item 1.1 was achieved through the global identification of the bands 1427-1518 MHz and 3400-3600 MHz for use by IMT. While the band

3400-3600 MHz is not identified for IMT for the entirety of Region 3, it was already identified for IMT in nine Region 3 countries (including Asia's four largest economies¹) prior to WRC-15, with Australia and the Philippines adding their country names to those existing identifications at the last Conference.

The following bands and countries were also identified for IMT in country-based footnotes at WRC-15:

- **470-608/614 MHz:** Bahamas, Barbados, Canada, Mexico, USA and Papua New Guinea;
- **614-698 MHz:** countries listed above plus Belize, Colombia and New Zealand;
- **3300-3400 MHz:** 7 countries in the Asia-Pacific, 6 countries in the Americas, 33 countries in Africa (on a no interference, no protection basis with respect to the radiolocation service);
- **3600-3700 MHz:** Canada, Colombia, Costa Rica and USA; and
- **4800-4990 MHz:** Cambodia, Laos, Vietnam and Uruguay.

The 700 MHz band—in which LTE/LTE-A networks have already been deployed in four countries in Region 3, including Australia, and already licensed to mobile operators in a further three countries—was formalised as a Region 3 IMT band in the ITU Radio Regulations through the identification of the band 698-790 MHz for IMT being extended from 10 to 26 Region 3 countries. Further, the identification of the 700 MHz band in Region 1 under WRC-15 Agenda item 1.2 means it has become a truly global IMT band.

Some administrations, despite being strong proponents of the identification of additional spectrum for IMT, have omitted their country names from footnotes because of either the unwillingness of other administrations to support such footnotes or the conditions of IMT use being too onerous. Consequently, IMT systems are likely to be deployed under mobile service allocations without footnotes identifying the relevant band for IMT. Examples include the omission of European countries from the footnotes identifying the bands 1452-1492 MHz and 3600-3700 MHz for IMT; and the omission of China and Japan from the footnote identifying the band 4800-4990 MHz for IMT.

WRC-15 Agenda item 10

The Conference agreed on the Agenda for the 2019 Conference, including WRC-19 Agenda item 1.13 that will consider the identification of frequency bands for the future development of IMT.

Resolution **238 (WRC-15)** defines the scope of WRC-19 Agenda item 1.13, which includes the requirement to determine the spectrum needs for the terrestrial component of IMT in the frequency range between 24.25 GHz and 86 GHz.

Study for potential identification for IMT will target specific frequency bands between 24.25 GHz and 86 GHz. Studies of sharing and compatibility between IMT and other services to which the bands are allocated are to be carried out over the new WRC cycle. The frequency bands to be studied are:

- 24.25-27.5 GHz
- 31.8-33.4 GHz
- 37.0-43.5 GHz

¹ China, Japan, India and South Korea.

- 45.5-50.2 GHz
- 50.4-52.6 GHz
- 66-76 GHz
- 81-86 GHz

As mentioned above for WRC-15 Agenda item 1.1, deliberations on WRC-15 Agenda item 10 lacked a willingness to negotiate by a number of key participants. The result is that WRC-19 Agenda item 1.13 is left with only one cm-wave (3-30 GHz) spectrum option to study; the only cm-wave band listed in Resolution **238 (WRC-15)** is 24.25-27.5 GHz.

AMTA recognises and appreciates the Australian Government’s support for the creation of WRC-19 Agenda item 1.13, and its support for the inclusion of a number of frequency bands, during the work of the Conference under WRC-15 Agenda item 10.

Following the conclusion of WRC-15, the first Conference Preparatory Meeting for WRC-19 (CPM19-1) decided that instead of allocating the work to Working Party 5D, sharing and compatibility studies are to be carried out by a new Task Group to be formed under Study Group 5 (TG 5/1). The spectrum requirements and technical characteristics for future IMT systems (IMT-2020) must be provided by WP 5D to TG 5/1 by 31 March 2017.

Impact of developments on the MBB Strategy

Strategy 5—Influencing international spectrum harmonisation

AMTA’s views on the ACMA’s proposed MBB Strategy 5—“Influencing international spectrum harmonisation”—on pages 10-12 of its initial submission to the Discussion Paper - are largely focussed on the ITU-R preparatory process for the WRC.

However, noting the outcomes of WRC-15 and the difficulty of achieving consensus in that WRC process (along with long timelines) AMTA suggests it may be beneficial to expand future international engagement beyond the WRC preparatory process to include a closer involvement in the work of peak industry organisations and standardisation bodies. AMTA considers that alternative means for formalising international harmonisation of radiofrequency spectrum may have to be explored if the WRC process continues to be unwieldy in the longer term. This alternative approach to international engagement could be particularly relevant to future plans for the 600 MHz and 2700-2900 MHz bands, and also to cm-wave bands already allocated to mobile services on a primary basis. Further detail is provided below for the relevant frequency bands.

Proposed Work Program

600 MHz

In the lead up to WRC-15, the ACMA had developed a clear position early in the preparatory process that the band 470-698 MHz would not be identified for IMT in Australia under WRC-15 Agenda item 1.1, noting extensive use of the band for digital television terrestrial broadcasting (DTTB). AMTA understood this position.

However, in the post-WRC-15 environment, and looking at the longer-term (i.e. beyond 2020) AMTA believes the ACMA should remain open to considering an upper portion of the 470-698 MHz (the 600 MHz band) being available for alternative uses such as mobile broadband services. This analysis

would be consistent with the Government's interest in the possibility of a second digital dividend using this spectrum.²

As mentioned above, the band 470-698 MHz (or 614-698 MHz) was identified for IMT services in nine countries, including all of North America (Canada, Mexico and USA), some Latin American countries, New Zealand and Papua New Guinea. This lays down the international regulatory basis for future use of the 600 MHz band for wireless broadband services in the US, which the Federal Communication Commission's 600 MHz incentive auction, to be carried out in March 2016, is intended to facilitate.

In the European Union (EU), Member States are more tentative in general. In February 2014, the European Commission (EC) requested its Radio Spectrum Policy Group (RSPG) provide its view on a long-term strategy on the future use of the UHF band³, which the RSPG delivered one year later. In its final Opinion⁴, the RSPG recommends, *inter alia*, that

- the band 470-694 MHz shall remain available for DTTB (in terms of legal certainty) until at least 2030; and
- EU Member States should have the flexibility to use the 470-694 MHz band for downlink-only wireless broadband services, essentially on a secondary basis with respect to broadcasting services.

Another major contribution to the EU process on the 600 MHz band was made six months prior to WRC-15 with the delivery of Mr Pascal Lamy's report to the European Commission⁵, which included a '2020-2030-2025' rule, which includes:

- safeguarding the regulatory security and stability for DTTB in the 600 MHz band until 2030; and
- a review to assess technology and market developments, to be undertaken by 2025.

In September 2015, the EC released an Inception Impact Assessment⁶ which included an alternative policy approach which supported both:

- Mr Lamy's '2020-2030-2025' rule; and
- a flexibility option for using the 600 MHz band for downlink-only wireless broadband services on a national basis, as recommended in the RSPG Opinion.

On one hand, the long-term game playing out in Europe suggests that the 600 MHz band could be kept at the monitoring stage in the MBB Strategy, but on the other hand, the accelerated

² (then) Minister of Communications Malcolm Turnbull's speech to Radcomms 2014, available at:

<http://www.malcolmturnbull.com.au/media/radcomms-2014-spectrum-in-the-age-of-digital-innovation>

³ European Commission, 27 February 2014, RSPG14-555—*Request for an Opinion on a long-term strategy on the future use of the UHF band (470-790 MHz) in the European Union*, available at: http://rspg-spectrum.eu/wp-content/uploads/2014/03/RSPG14-555final_Request-for-Opinion-UHF-band.pdf

⁴ EC RSPG, 19 February 2015, RSPG15-595—*RSPG Opinion on a long-term strategy on the future use of the UHF band (470-790 MHz) in the European Union*, available at: <http://rspg-spectrum.eu/rspg-opinions-main-deliverables/>

⁵ European Commission, 1 September 2014, Press Release—*Radio spectrum: Pascal Lamy presents his report to the Commission*, available at: http://europa.eu/rapid/press-release_IP-14-957_en.htm

⁶ European Commission, 22 September 2015, Inception Impact Assessment—*Union strategy for the future use of the UHF broadcasting band (470-790 MHz), including the 700 MHz band (694-790 MHz)*, available at: http://ec.europa.eu/smart-regulation/roadmaps/docs/2015_cnect_017_uhf_en.pdf

developments in the Americas indicate there is an opportunity for the ACMA's MBB Strategy to take a more proactive interest in this band.

As has been recommended to the EC by the RSPG in its final Opinion, AMTA recommends that where possible, the ACMA should encourage and facilitate the implementation of more spectrally-efficient DTTB broadcasting technologies, noting the evolution path of the DTTB platform (e.g. DVB-T2 and HEVC coding). This is likely to simultaneously benefit the broadcasting industry and facilitate future flexibility in spectrum management options.

2700-2900 MHz

WRC-15 decided not to allocate the band 2700-2900 MHz to the mobile service on a primary basis, nor was it identified for consideration under any WRC-19 Agenda item. As such, AMTA's comments on international engagement on the band in relation to its consideration under WRC-15 Agenda items 1.1 and 10 at WRC-15 have expired.

However, AMTA's previous comments on encouraging the ACMA to progress the band to Stage 1 (the initial investigation stage) remain valid. Listing the band at Stage 1 is more representative of the progress of the work carried out—both international and domestic—on planning options and sharing between mobile broadband and radar services.

AMTA will continue to liaise with the ACMA and incumbent users of the band to identify opportunities for allocation of the band for mobile broadband services in the context of a review of Government spectrum holdings, while in parallel, communicating with international organisations regarding the development of technological developments in the band.

Bands above 6 GHz

As a follow-up to AMTA's comments on pages 13-14 of its initial response to the Discussion Paper, AMTA applauds the Australian administration's support for the creation of WRC-19 Agenda item 1.13, along with its active support for a number of frequency bands to be included in the scope of the Agenda item.

This active support for the study of frequency bands in the new WRC cycle means that bands above 6 GHz should be progressed to the initial investigation stage (Stage 1) to flag the need to begin work under WRC-19 Agenda item 1.13 on the frequency bands listed in Resolution **238 (WRC-15)**. Now that the new WRC cycle has commenced, the "monitoring" activity at Stage 0 does not accurately reflect the need for both industry and the ACMA to start considering as soon as possible the:

- spectrum requirements for future mm-wave IMT systems;
- technical characteristics of both mm-wave IMT and other services to which the bands are allocated;
- relevant propagation mechanisms; and
- characteristics of sharing and compatibility studies.

As we progress through the WRC-19 cycle, it would be practical to separate the "bands above 6 GHz" item within the MBB Strategy into separate frequency bands, at different stages, as appropriate. For this reason, the MBB Strategy should truly be a 'living document' and remain highly flexible with respect to bands above 6 GHz.

While WRC-15 could only agree on frequency bands above 24 GHz to be studied under WRC-15 Agenda item 1.13, AMTA notes that interest in spectrum between 6 GHz and 24 GHz remains strong

among the global mobile telecommunications industry. The desirability of this spectrum range has been well summarised by several major vendors:

“Spectrum below 20 GHz exhibits propagation characteristics that can facilitate technology using relatively simple antenna systems that are better for area coverage. This makes it critical for some of the applications... that require wide area coverage and good penetration through and around obstacles, e.g. smart city, ultra-reliable and some M2M applications”.⁷

The physical properties of this spectrum, and the associated benefits for future IMT systems, have not been diluted by the deliberations of WRC-15. It is therefore likely that the global mobile telecommunications community will continue to consider opportunities in this frequency range—albeit outside the WRC process but in accordance with the ITU Radio Regulations and limited to frequency bands already allocated to the mobile service.

As we move simultaneously into the new WRC study cycle, and the standardisation stage for future 5G services, the MBB Strategy should remain particularly flexible with respect to bands above 6 GHz. Notwithstanding the importance of the WRC process, and the associated outcomes reflected in the ITU Radio Regulations, it will be prudent for Australia to stay abreast of developments outside this process.

3400-3700 MHz

The quasi-global identification of the 3400-3600 MHz band for mobile services has confirmed the status of the band as a key spectrum option for mobile broadband services around the world. On the other hand, as explained above, the identification of the band for IMT use by only four countries in the Americas does not give an accurate indication of the worldwide interest in this band for IMT. A number of other administrations (including countries in Europe and Japan) are strong proponents of IMT deployment in this band but do not have footnotes for this purpose in the Radio Regulations.

For these reasons, the developments at WRC-15 have not changed AMTA’s views on the 3400-3700 MHz band as presented in its initial response to the Discussion Paper.

Conclusion

AMTA’s views on the development of the ACMA’s MBB Strategy have been provided in its initial submission (30 October 2015) in response to the Discussion Paper. In this update to the submission, AMTA offers supplementary comments on the international engagement strategy and on specific frequency bands, in the context of the conclusion and outcomes of WRC-15.

The global identification of the bands 1427-1518 MHz and 3400-3600 MHz for IMT confirms their importance for the provision of mobile broadband services in Australia over the coming years, and as such verifies the need for their consideration as priority bands in the MBB Strategy.

The absence of mobile broadband spectrum below 24 GHz on the WRC-19 Agenda means that a different strategy will be needed to identify additional spectrum for IMT in this frequency range. AMTA suggests that this strategy include a greater focus on the domestic radiocommunications environment (including regulatory frameworks) and seek closer engagement with relevant international fora outside the ITU-R. This is particularly relevant to the 600 MHz, 2700-2900 MHz and cm-wave bands.

⁷ Ericsson, Huawei, Intel Corporation, Nokia and Samsung Electronics UK, July 2015, CPG-PTA(15)136—WRC-15 Agenda item 10: New Agenda item on IMT above 6 GHz

The most significant body of work on MBB in this WRC study cycle will be under WRC-19 Agenda item 1.13 to identify IMT allocations in the bands between 24 GHz and 86 GHz. The MBB Strategy needs to remain flexible with respect to bands above 6 GHz as we move simultaneously into the new WRC study cycle and the standardisation stage for future 5G services. Again, increased engagement with international fora outside the ITU should be pursued, to reduce the impact of potential shortcomings in the ITU processes leading to the decisions at WRC-19.

AMTA understands that the ACMA's MBB Strategy will continue to be developed by the ACMA in consultation with stakeholders. AMTA welcomes the ACMA's consultative approach and notes that we are still to forming views on some matters, such as the review of the 803-960 MHz band.