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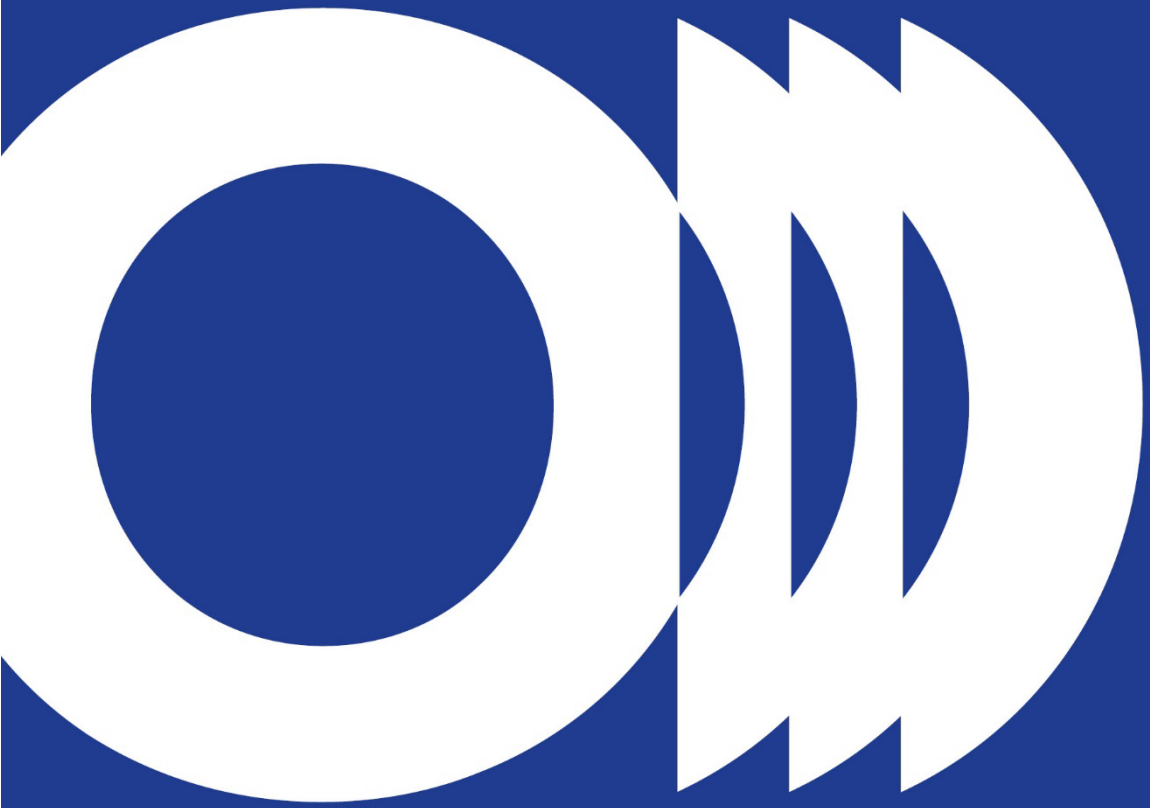
POSITION PAPER

EBU reacts to the RSPG Draft Opinion on the future use of the frequency band 470-694 MHz

23 AUGUST 2023



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EBU comments on the RSPG Draft Opinion on the Strategy on the future use of the frequency band 470-694 MHz beyond 2030 in the EU

OVERVIEW

The European Broadcasting Union[1] (EBU) and its Members welcome the opportunity to comment on the Radio Spectrum Policy Group ('RSPG') Draft Opinion on the Strategy on the future use of the frequency band 470-694 MHz beyond 2030 in the EU ('Draft Opinion').

The EBU appreciates the comprehensive approach taken by the RSPG to encompass all aspects of the possible uses of the Lower UHF band, a crucial infrastructure for Public Service Media (PSM) not only from a technical point of view, but also from a social perspective. We recognise the difficulty of the task given the diversity among EU Member States and we support the RSPG's conclusion that a single scenario may not be applicable to all Member States. The current regulation already provides the required flexibility for the different uses and no immediate regulatory changes are necessary.

We also recognise, as does the RSPG, that the implementation of some of the possible uses considered in the Draft Opinion might be very challenging in terms of technical compatibility with existing uses. In particular, we support the RSPG's Recommendation that a harmonised FDD 600 MHz band plan throughout the EU is not realistic.

The EBU notes that all the scenarios for use of the band after 2030 discussed in the draft Opinion retain the use by broadcasting services in different degrees. Broadcasting services are essential for PSM as they provide free to air high-quality content and services to inform, educate and entertain every citizen wherever they are. They also support national sovereignty in providing reliable information to citizens, vital in times of crisis and in emergency situations. Broadcasting services need to retain access to the 470-694 MHz band well beyond 2030 and possibly until at least 2040.

To sum up, the EBU welcomes the balanced approach in the Draft Opinion prepared by the RSPG. We provide some specific comments to the different sections in the rest of this document. Information on additional 5G Broadcast trials is provided by the EBU at the end of the document for consideration for inclusion in Annex III of the Draft Opinion.

[1] The European Broadcasting Union (EBU) is the world's leading alliance of public service media (PSM). It is a not-for-profit organisation that represents 112 member organizations in 56 countries and additional 31 Associates worldwide. PSM organizations are entrusted with providing a service of general interest, which consists in the provision of high-quality content and services that fulfil the cultural and democratic needs established at national level for the people of each EU Member State.

A. THE ESSENTIAL ROLE OF THE UHF BAND FOR PSM

The 470-694 MHz band is crucial for the audiovisual industry as it is the only band used by Digital Terrestrial Television (DTT[2]) in all Member States and the most important band used by audio Programme-Making and Special Events (PMSE). PSM need to continue using both if they are to fulfil their public service obligations: DTT is the only TV platform that provides free-to-air services in all Member States and that can reach everyone, whilst the content that is thereby distributed is created using PMSE equipment that operates in this band. Moreover, audio PMSE services operating in the UHF band are crucial for the production of audiovisual content whatever the form of delivery, be it live on stage, live or on-demand online, on cable, satellite, terrestrial broadcasting, etc.

DTT is by nature a digital solution. Digitisation has been pushed from the outset by PSM, as it is simple to use and allows more innovation. This is how PSM have also developed hybrid approaches to distribution, combining broadcasting and broadband with e.g. HbbTV or DVB-I technologies. Upcoming innovations also include the introduction of Ultra-High Definition in the DTT platform, ensuring even better quality of user experience, and the deployment of 5G Broadcast, to bring broadcast's robustness, reliability and quality to mobile devices. This innovation and related necessary investments in this critical tool for citizens and the wider cultural eco-system can only happen if broadcasters continue to have access to the Lower UHF band. The latest figures show that EBU Members invest around 20 Billion euros on content per year[3].

The UHF band 470-694 MHz is governed, in ITU Region 1, by the ITU Geneva 2006 Agreement (GE06) which is a fundamental pillar of the regulatory framework alongside Decision (EU) 2017/899. **GE06 will continue to apply in this band, and that should be acknowledged in the Draft Opinion**.

B. COMMENTS ON THE DRAFT RSPG OPINION

2. Review of the RSPG15-595 FINAL Opinion on the 470-694 MHz band

As mentioned, access to the Lower UHF (470-694 MHz) band is crucial for both main aspects of PSM activities: production and distribution of high-quality content to inform, educate and entertain all people in a given European State. This was well explained in the RSPG15-595 FINAL Opinion, e.g.[4] "RSPG believes that DTT will continue to play an essential role for the foreseeable future due to its characteristics of delivering high-quality linear services to mass audiences and ensuring universal and free-to-air access for citizens", and "PMSE does not only support the broadcasters, but also plays an important and indispensable role in countless events, be it for cultural, societal or business purposes". Anchoring the RSPG Opinion in the already existing work developed on the Lower UHF band is key to enable a sound debate[5].

The EBU would therefore commend the following remark in the Draft Opinion[6] "the importance of DTT and the need to provide certainty for investments are reflected by recommendations

[2] DTT is watched by 43% of households in the EU, with variations depending on the Member State.
[3] Freely available against log-in creation: https://www.ebu.ch/files/live/sites/ebu/files/Publications/MIS/login_only/infographic/EBU-MIS-Impact_of_PSM_Infographic.pdf
[4] RSPG15-595 FINAL Opinion, page 17.
[5] Another important point from this perspective is the acknowledgement that "spectrum needs for broadband PPDR services differ largely between Member States" and "Since the decision on a deployment of broadband PPDR networks is a national matter, it does not require a measure on EU level". See RSPG15-595 FINAL Opinion, page 18.
[6] Draft Opinion, page 6.

8-10 [of the RSPG15-595 FINAL Opinion], which aimed to define a stable framework for the use of the sub-700 MHz band, with a time horizon beyond 2030, and at the same time offering the possibility of national flexible use of the frequency band for WBB downlink". These recommendations were implemented in Article 4 of Decision (EU) 2017/899 and are indeed cardinal for the Draft Opinion. **Therefore, we conclude that the principle of Article 4 is applicable beyond 2030**.

3. Existing Flexibility

Part 3 of the Draft Opinion is built on an analysis of Article 4 of Decision (EU) 2017/899 as it is one of the only EU rules including this concept. While giving priority to broadcasting services until at least 2030 of the use of the 470-694 MHz band, it provides the possibility of using the band for other any other use if broadcasting services in the neighbouring countries are protected and if this alternative use does not claim protection.

EBU agrees as well that the GE06 Agreement, governing the use of the band by broadcasting services, provides the procedures to implement such flexibility via the 'envelope concept'. The concept relies on the equivalence of spectral power density to allow the use of a frequency assigned for DVB-T by another primary service of equivalent spectral power density. Declaration 42, signed by all EU Member States, extends the concept to any type of service irrespective of whether or not it has a primary status in the table of frequency allocations of the ITU.

EBU agrees that, as pointed out in section 3.3.3 of the Draft Opinion[7], various studies have shown that broadcasting and mobile services (IMT) cannot operate on the same frequencies in the same or adjacent areas without causing harmful interference to each other. The interference can be reduced by geographically separating the services with large distances, which could go, in some cases, up to several hundred kilometres, in particular in case of interference to uplink mobile services. This has also been confirmed by real interference cases[8] and was one of the main reasons for the coordinated clearance of DTT and re-purposing of the 700 MHz and 800 MHz bands.

The Draft Opinion also recognizes that Member States have not made use of the existing regulatory flexibility in Article 4 and the GE06 envelope concept, apart from some local trials with 5G Broadcast[9] and SDL. **We note that no Member State has extended this flexibility to introduce mobile cellular (IMT) networks or PPDR services below 700 MHz**. As mentioned in section 3.4 of the Draft Opinion[10], **there has been no market demand or business case identified so far in most Member States for new applications other than broadcasting and PMSE.**

It is noted that, in contrast, flexibility has been implemented on a national level, as broadcasting services have been sharing the UHF band with other services (e.g. audio PMSE, Radioastronomy, wind profile radars) for many years.

3.3 Existing technical solutions – Opportunities and limits

The Draft Opinion analyses three different new applications which could use the flexibility in Decision (EU) 2017/899 and in the GE06 Agreement: mobile downlink only (SDL), 5G Broadcast and mobile FDD (uplink and downlink band plan).

[7] Draft Opinion, page 13.
[8] See, for example, Report ITU-R BT.2301-4.
[9] ETSI TS 103 720 V1.2.1 (2023-06) 'LTE-based 5G terrestrial broadcast system'.
[10] Draft Opinion, page 14.

5G Broadcast is the only one of these that is a 'broadcasting service'[11] and it is to be deployed as broadcast networks which are mainly high power/high tower sites complemented by gap fillers of lower power and height. Recent trials[12] have shown that such configurations are viable, in contradiction to the claim in section 3.3.2 of the Draft Opinion that this "configuration … does not enable to have sufficient received field strength, necessary for a good mobile reception…". In addition, under this network configuration, similar to DTT, 5G Broadcast does not create additional interference issues to what exists with DTT. Similar adjacent channel situations will occur and can be solved in the same way as between DTT signals (e.g. co-siting, modifying antenna diagrams, orthogonal polarisation usage). EBU would also like to point out that with the addition of 8 MHz channel bandwidth, 5G Broadcast can use the full potential of GE06 digital entries, which are harmonized at 8 MHz. **The ETSI Standard has recently been updated accordingly and we propose to reflect this in the Draft Opinion**.

EBU agrees with the RSPG assessment in section 3.3.3[13] that the flexibility afforded by Article 4 for a mobile frequency arrangement with uplink and downlink would not be possible while preserving the current spectrum resources for the evolution of broadcasting services in other countries. We agree that some Member States are expected to continue to use the band for broadcasting well beyond 2030 and that "Therefore, the use of the FDD 600 MHz band plan is not expected to be implemented throughout the European Union".

We note that, in Section 3.3.3[14], the values in the table quoted from Report ITU-R BT.2337-1 and the technical considerations above the table need to be aligned.

EBU also agrees that SDL would be easier to implement than a full FDD band plan. However, SDL is a mobile service that would be deployed by mobile network operators using dense low-power networks. Coexistence of SDL with DTT and/or 5G Broadcast using high-power, high-tower sites, would be difficult in terms of adjacent channel interference. This type of interference between broadcast services can be mitigated, for example, by co-siting the services. Co-siting broadcasting and mobile services like SDL seems difficult and even impossible when considering different types of networks. Adding filters to roof-top antennas is another mitigation option in cases of fixed broadcast reception but it would be impractical in the case of SDL using interleaved frequencies.

4. Possible and technically feasible scenarios for post 2030

The Draft Opinion discusses three possible scenarios for post 2030 in different EU member states. The EBU believes that scenario 1 (Prevalent broadcasting), which focuses on DTT, will prevail in many countries in the EU for the foreseeable future, well after 2030 and possibly until at least 2040 as noted by the RSPG.

EBU is concerned about scenario 2 (Broadcasting (DTT and 5G Broadcast), Mobile limited (SDL)). As explained in Section 3.3 above, SDL is a mobile service to be deployed by mobile network operators using dense low power networks. Adjacent channel interference between SDL and DTT/5G Broadcast will be difficult to mitigate, in particular in the case of use of interleaved frequencies.

The prospects of scenario 3 (Broadcasting limited, Mobile (Full FDD band plan)) are however very low, due to the technical compatibility difficulties described in sections 3 and 3.3. Without further detailed technical studies, it is difficult to know if sharing between the services can be possible.

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[11] See Section 3.3.2 of the Draft Opinion "It should be noted that 5G Broadcast is an application of the Broadcast Service", page 11.
[12] https://drive.google.com/file/d/1CznXRhhNboNVvXVI6oTqiF2f6brlONxb/view
[13] Draft Opinion, page 12.
[14] Draft Opinion, page 13.

5. Recommendations

The EBU believes that the recommendations in the Draft Opinion are balanced and well justified. It is important to note that[15] the "RSPG recognises the possibility that, for the use of the 470-694 MHz band, a single scenario may not be applicable to all Member States" even after 2030 and that in particular "a harmonised implementation of a mobile band plan including uplink (e.g. 600 MHz) up to 2030 is not possible in the European Union".

The EBU also supports the important recognition by the RSPG that in addition to the technical evolution of television services, there are other important non-spectrum-related, and often nation-specific, factors such as market demand, audiovisual policy and sovereignty, which will be crucial in the coming years in shaping the use of the 470–694 MHz band after 2030. The existing regulation provides flexibility to take account of the diversity of national situations.

The EBU notes that the case covered by recommendation 5 is already addressed by Article 4 of Decision (EU) 2017/899.

Finally, given the continued importance of the band for content creation and delivering services to citizens, as recognised in the RSPG15-595 Final Opinion in particular recommendations 8-10, EBU proposes that equivalent recommendations are included in the Draft Opinion for the years after 2030. These would recognise the importance of the DTT platform and the need to provide certainty for investments in broadcasting infrastructure and of PMSE, crucial for content and creative industries.

For further information, please contact:

Elena Puigrefagut, EBU Senior Project Manager, puigrefagut@ebu.ch

Vincent Sneed, EBU Senior EU Policy Adviser, sneed@ebu.ch

[15] Draft Opinion, page 19.

To be added in

Annex III

5G Broadcast Trials

5. Germany

Between October 2020 and December 2022 a cross-industry consortium consisting of public service media, car manufacturers, telecom operator, network infrastructure providers and universities carried out a comprehensive 5G Broadcast project, called 5G Media2Go, in the wider Stuttgart area with the following objectives:

- Verification of 5G Broadcast as a system being capable of delivering linear media services to in-car infotainment systems.
- Deployment of a 5G Broadcast network in the wider Stuttgart area consisting of two high-power-high-tower transmitters (HPHT) and a set of low-power-low-tower stations (LPLT).
- Integration of different media services in the infotainment system of a car, i.e. linear TV, ARD Mediathek and georeferenced recommendations.
- Execution of measurement campaigns to assess quality of service and coverage of the 5G Broadcast transmissions.

To this end, a 5G Broadcast network was deployed consisting of two HPHT stations operating at 73 and 20 kW, respectively, and up to four smaller stations with ERPs in the range of 200 W- 1 kW. TV channel 40 was used which corresponds to an unused GE06 plan entry. As this frequency was fully coordinated upfront, no interference issues were reported.

Prototype smartphones could be used to receive and display 5G Broadcast signals showing satisfying performance within the expected range. Moreover, emergency alert notifications over 5G Broadcast were implemented on the occasion of the so-called German “Warntag” where all emergency systems in Germany were tested.

In summary, the following major conclusions can be drawn from the investigations carried out in 5G Media2Go:

- 5G Broadcast is capable to deliver linear TV and radio services to smartphones and infotainment systems in vehicles.
- 5G Broadcast supports delivering linear services at high speeds of up to 180 km/h.
- 5G Broadcast can be configured to distribute different data stream formats, e.g. MPEG Transport Stream and MPEG Dash.
- 5G Broadcast supports network operation in single frequency mode including both HPHT and LPLT transmitters.
- The integration of 5G Broadcast transmissions alongside with unicast communication on infotainment systems of vehicles to grant access to nonlinear services is straightforward. This allows to offer hybrid services which combine linear and nonlinear elements.

- A particular spin-off of the project is the Travelguide application. The relevance of geo-referenced recommendations will increase as mobile media consumption will grow.

Further 5G Broadcast trials can be found in:

- https://www.5g-mag.com/trials
- EBU Technical Report 044 'TRIALS TESTS & PROJECTS ON '4G/5G BROADCAST' BY EUROPEAN PSBS'
- ITU-R Report BT. ITU-BT.[TRIALS-NEW-TMMB] - Collection of field trials of Terrestrial Multimedia Mobile Broadcasting systems