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WHITE PAPER

'NO CHANGE' AT WRC-23 MAXIMIZES PUBLIC VALUE AND INNOVATION IN THE UHF BAND

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'No Change' at WRC-23 maximizes public value and innovation in the UHF band

Today, UHF spectrum below 700 MHz is intensively used throughout Europe, both for DTT and for wireless production systems (known as PMSE¹). Certain regulators and industry stakeholders argue that the sub-700 MHz band should also be open to mobile telecoms services, believing that it could help to address deficiencies in mobile coverage of rural areas. This is even though international studies have shown that broadcasting and mobile services cannot operate on the same frequencies in the same or adjacent areas without causing harmful interference to each other.

Changing the existing regulations to enable this so-called “co-primary” allocation of the sub-700 MHz band to both broadcasting and mobile services would not bring the claimed “regulatory flexibility”. Rather it would result in regulatory *inflexibility*: interminable and complex negotiations between countries to avoid interference between services. It would also render large parts of the band unusable in certain areas. Far from improving mobile coverage, it would stifle the emergence of innovative new services based on broadcast technologies and would further squeeze the PSME services that power Europe’s creative output.

The upcoming 2023 World Radiocommunications Conference (WRC-23) will consider revising the regulations that deal with the sub-700 MHz band, taking a decision that will impact on which services use this band in the future. The EBU believes that maximizing public value *and* promoting innovation in the UHF band requires the regulatory stability provided by the current regulation.

The EBU therefore supports a position of ‘no change’ to the Radio Regulations under WRC-23 agenda item 1.5. This paper explains that position in more detail.

Background

The sub-700 MHz band, from 470 - 694 MHz, is used by almost all countries to provide free-to-air digital terrestrial television (DTT) services to their audiences. It is also a key band for wireless production systems such as radio microphones and talkback systems (collectively referred to as PMSE¹).

WRC-23 will consider revising the part of the Radio Regulations, the international treaty on management of radio spectrum, that deals with the sub-700 MHz band. As preparations take place for WRC-23, the EBU is actively advocating that there be no change to the regulation (WRC-23 agenda item 1.5), which would represent the best outcome for audiences and public service media (PSM).

PSM must be available to all

PSM organizations are required by national rules to deliver high-quality content and services to inform, educate and entertain every citizen wherever they are. To serve all segments of society and live up to the universality principle, PSMs must be present on all relevant audio and audiovisual platforms, whether broadcast or on the internet, with linear and non-linear content, and they must be easily findable.

¹ Programme Making and Special Events - PMSE

Broadcast networks are essential for the distribution of linear radio and television services, and that will remain important for many years. Present in all countries, the relative importance of broadcasting varies from one country to another. In particular, DTT in the UHF band remains crucial for its efficient delivery of linear services to very large audiences, its near-universal reach, its free-to-air focus, and its resilience in times of crisis. Both public service and commercial channels are provided via DTT, contributing to healthy competition in the media sector and generating commercial value alongside the considerable public benefits.

DTT is implemented in all EU countries and in almost all European countries. Examining the primary TV receiver platform market share in the EU in 2019, compared with that in 2013, shows that DTT remains, alongside satellite networks, the preferred television platform (29% market share for each platform); in contrast, IPTV consumption is increasing but remains lower compared to DTT and satellite (20%)². If secondary TV sets are considered, DTT clearly remains the preferred platform for linear television viewing.

Linear television viewing remains stable: 3 hours 32 min per day in 2019, which even increased to 3 hours 43 min per day with peaks of over 5 hours). Live television accounted for 89% of this viewing, with 11% time shifted³.

More mobile allocation in the UHF band won't increase broadband availability

The European Commission DESI April 2020 report showed that “[t]he EU harmonised radio spectrum for wireless broadband use amounts to 4340 MHz”⁴. In particular, substantial UHF spectrum resources (i.e., the 700 MHz, 800 MHz, and 900 MHz bands) are already available for mobile services. These allocations, largely of spectrum previously used by DTT and PMSE, were justified by the need to develop rural broadband. The current deficiencies in mobile coverage of rural areas can only be resolved by further investment in network infrastructure, not with additional spectrum in the UHF band. Where mobile network capacity needs to be increased, this can be achieved by network densification and using the higher frequency bands that are much better suited for this purpose and that are already available for mobile services⁵.

Besides, it should be noted that a substantial part of the digital connectivity⁶ target set in the Path to the Digital Decade⁷ will most likely be attained primarily with the development of fibre networks⁸. Already today, most of the wireless usage follows this pattern with the wide use of Wi-Fi networks. Most data-hungry usages over the internet such as audiovisual content or services are consumed in a static mode thanks to wired broadband and fibre connections complemented by Wi-Fi delivery. Mobile broadband technologies such as 3G, 4G or 5G are only usefully used for smaller scale data consumption when moving.

² From the European Audiovisual Observatory.

³ EBU Report ‘Audience trends Television 2021’:

https://www.ebu.ch/files/live/sites/ebu/files/Publications/MIS/login_only/audiences/EBU-MIS-TV_Audience_Trends_2021-public.pdf.

⁴ See European Commission Digital Economy and Society Index (DESI) 2020, page 43.

⁵ See DESI 2020, page 44.

⁶ “All European households are covered by a Gigabit network, with all populated areas covered by 5G”.

⁷ See European Commission dedicated [page](#).

⁸ See DESI 2020, page 15: “The EU has full coverage of basic broadband infrastructure, but only 44% of households benefit from VHCN connectivity. VHCN includes fibre to the premises (FTTP) and cable DOCSIS 3.1 technologies. VHCN coverage significantly increased in 2019, as the upgrade of European cable networks started in several Member States. As both FTTP and cable largely concentrate on urban areas, rural connectivity remains low at 20% of households, well below the national average.”

Why the “regulatory flexibility” option is not realistic

It is suggested by certain regulators and industry stakeholders that the sub-700 MHz band should be allocated on a co-primary basis to both broadcasting (DTT and PMSE) and mobile services. It is suggested that such an allocation would facilitate the provision of wireless broadband in remote areas, increase the quality of mobile services, and provide “regulatory flexibility”. The argument is that such flexibility would allow national regulators to decide how to use the UHF band in their own country and in accordance with the national need for broadcasting and mobile services.

The EBU's view is that this flexibility would not result from such a decision. Various studies⁹ and real cases¹⁰ have shown that broadcasting and mobile services 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 mobile services from the broadcasting services. The required separation distances are, however, very large (and in some cases, several hundred kilometres).

The consequence is that, in densely populated Europe, each country's use of the UHF band has a significant effect on neighbouring countries. In the absence of large-scale coordination, the result of a co-primary allocation would be that in large areas of Europe, neither terrestrial broadcasting nor mobile services could be deployed in large parts of the sub-700 MHz band.

Additionally, the deployment of mobile services in the sub-700 MHz band would further reduce the spectrum available for PMSE use, as the two services cannot operate on the same frequencies in the same place and coordination between them would be rather impractical.

The current proponents of a co-primary mobile allocation do not explain how co-existence between mobile services and the current users of the spectrum could be achieved. From the practical experience gained with the 700 MHz and 800 MHz bands, the choice of whether to continue using the band for DTT and PMSE or to use it exclusively for mobile services needs to be made for all of Europe, rather than on a country-by-country basis. Hence a co-primary allocation would mean no flexibility.

Broadcasting innovates to meet audience trends

The DTT platform is evolving to more spectrum-efficient technologies: DVB-T2 combined with high-efficiency video coding standards allows the introduction of free-to-air HDTV and UHD TV services in the UHF band.

The way in which media content and services are delivered to viewers and listeners is evolving, and in particular, is driven by the rise of the internet and the popularity of personal devices (smartphones, tablets) to access audio and audiovisual media content and services.

The internet has enabled new types of service (e.g., on-demand, interactive, hybrid), new distribution models such as OTT, and a continuously expanding choice of content available to users. PSM organizations acknowledge the need to meet changing audience behaviour and expectations and they embrace the opportunities that IP technology provides in content distribution. Today, all EBU Members provide online services, both linear and on-demand, via broadband networks.

⁹ See [Report ITU-R BT.2337](#) “Sharing and compatibility studies between digital terrestrial television broadcasting and terrestrial mobile broadband applications, including IMT, in the frequency band 470-694/698 MHz”

¹⁰ See [Report ITU-R BT.2301](#) “National field reports on the introduction of IMT in the bands with co-primary allocation to the broadcasting and the mobile services”

However, distribution over the internet is a complement to, rather than a substitute for, dedicated broadcast networks such as DTT or satellite. The penetration of broadband networks is not universal; except for fibre networks, they do not scale well for very large simultaneous audiences, they do not support free-to-air reception, and prominence for PSM services is not assured. The EBU and its Members are therefore actively engaged to ensure that emerging technologies for IP-based distribution of content and services will be able to meet the future requirements of PSM organizations and their audiences.

A new technology has been standardized as [ETSI TS 103 720](#) 'LTE-based 5G terrestrial broadcast system' and it is a candidate technology for introduction in the sub-700 MHz band. It is a new broadcasting system to be deployed in a downlink only frequency arrangement often called Standalone downlink-only ("SDO") that uses 5G components as in wireless broadband networks. However, unlike mobile broadband networks, standalone 5G Broadcast supports free-to-air and 'receive-only mode' services and devices without a subscription to a mobile network operator (as well as subscription-based services).

Since 2015, there has been significant work by broadcasters to build on standalone 5G Broadcast, including standardisation in 3GPP and ETSI, together with many trials, tests and projects with stakeholders from across the value chain. These have included not only PSM, but also national and regional governments, regulators, mobile network operators and equipment manufacturers.

With standalone 5G Broadcast, PSM organizations will have an option to support media consumption on mobile devices (smartphones, tablets, cars) in full compliance with their public service remit. Importantly, standalone 5G Broadcast can use the sub-700 MHz band as it is designed to be used alongside DTT without interference¹¹.

Enhancements to DTT, such as DVB-T2 and new compression standards, as well as new technologies such as standalone 5G Broadcast can be introduced in the UHF band under the current regulatory framework provided by the GE06 Agreement and by the EU Decision 2017/899 on the use of the 470 - 790 MHz band in the Union¹².

The UHF band is also indispensable for creative and content industries

Alongside DTT, the UHF band is extensively used for wireless production audio systems such as radio microphones. This technology, commonly known as PMSE, is indispensable not only for broadcasters and other content producers but also for cultural, sporting, artistic, political, religious, educational, and civic society organizations. Some of these are significant economic sectors.

The long-standing successful sharing of the UHF band by DTT and PMSE is a prime example of the efficient use of spectrum. Furthermore, innovation is prevalent in the PMSE sector, reflected in the increasing complexity of productions, the introduction of digital audio technologies, and the adoption of IP- and cloud-based workflows. 5G and DECT-2020 are also being considered for some PMSE applications.

The spectrum available for PMSE services has been substantially reduced in recent years because of the reallocation of the 700 MHz and 800 MHz bands to the mobile broadband services. However, as demand for complex productions continues to increase, so does the need for spectrum. Therefore, a further reduction of the available spectrum carries a real risk that supply of spectrum for audio PMSE

¹¹ See EBU Technical Reports [TR 063](#) '5G Broadcast Network Planning and Evaluation' and [TR 064](#) 'Compatibility between 5G Broadcast and other DTT systems in the sub-700 MHz band'

¹² <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017D0899&rid=2>

applications will not meet demand in the not-too-distant future. This would have an adverse effect on all the sectors that rely on PMSE services.

'No Change' at WRC-23 maximises the public value and innovation in the UHF band

Today, DTT in the UHF band provides public as well as commercial value to society and it, alongside PMSE, will remain important in many countries for a long time. DTT is designed to be very resilient, and it is therefore indispensable in cases of emergency or natural disaster to provide vital information to the population at any time.

The EBU believes that maximizing public value *and* promoting innovation in the UHF band requires the regulatory stability provided by the current regulation. Indeed, introducing regulatory changes at this time would jeopardise the public and commercial value that DTT and PMSE services currently deliver in the UHF band, and they would discourage the innovation and investments required to retain and increase this value in the future.

The EBU therefore supports a position of 'no change' to the Radio Regulations under WRC-23 agenda item 1.5.