



European Cultural Band

An innovation roadmap for the lower UHF band



Europe 2040

Our vision



Europe 2040

Our vision

UNIVERSALITY AND ACCESSIBILITY

Culture and media content remain universally available and accessible to all European citizens regardless of their location, age and wealth.

EUROPEAN DIVERSITY AND RICHNESS

Culture and media content represent and portray the national and regional diversity and richness within Europe, and embody the values and ideals that bring all of us together.

LOCAL AND SUSTAINABLE

Cultural and media industries thrive thanks to local talent and companies that aim for a sustainable and inclusive development.

FAIR AND DYNAMIC SINGLE EUROPEAN MARKET

Ignited by fair competition and cross-border collaboration, the single European culture and media market enables the exchange of ideas and business development across the continent.

LONG-TERM REGULATORY VISIBILITY TO BOOST COMPETITIVENESS

The security and long-term visibility provided by a dedicated spectrum band as well as a common regulatory framework foster investments in the European cultural and media industries and strengthen their competitiveness.



Europe 2040

Our vision

INNOVATION FOR ALL EUROPEANS

Culture and technology work together to innovate and deliver the highest public value, having a positive impact on all European citizens.

A STRONGER EUROPE

Spectrum is efficiently used to secure European sovereignty, resilience and independence.

EUROPE AS A ROLE MODEL FOR DEMOCRACY

The European media system upholds the highest professional and quality standards, enabling the articulation of a reliable public sphere, and providing citizens with trustworthy information that contributes to a well-functioning democracy.

RELEVANT PUBLIC SERVICE MEDIA

Public service media excels at fulfilling the cultural, social, and democratic needs of all citizens without depending on third-party platforms.



To turn this vision into a reality,
Europe needs to secure a long-term
allocation of the lower UHF Band,
recognized as the

European Cultural Band

The European Cultural Band

- **Maximizing the use of the lower UHF band**

The European Cultural Band is a spectrum-based platform for technology innovation as well as culture development and distribution that relies on the use of the 470–694 MHz band.

- **An opportunity for innovation and spectrum efficiency best practice**

It creates the opportunity to launch an ambitious innovation roadmap that will benefit European citizens and businesses. It is a sharing and efficiency best practice in spectrum management, as it enables the combination of DTT services with PMSE uses and other services such as radio astronomy.

- **A common public space for societal and democratic progress**

It embodies the recognition by European authorities of the relevance of culture and the media for societal and democratic progress, and therefore the need for a common public space that secures their development.

- **A tool for European integration**

It is a tool to strengthen European integration, the consolidation of the European single market and the sustainable development of cultural and media industries.

- **An option against misinformation**

It is a policy option to protect the European media landscape against misinformation and secure a well-functioning democracy.

- **An instrument to enable pluralism and fair competition**

It is a policy instrument to build a robust, regulated and free-to-air platform that enables pluralism and fair competition within a media ecosystem framed by European values and aspirations.



The European Cultural Band – Innovation Roadmap

Innovation
for European
Citizens and
Businesses

1

Enhanced user experience

Improving the user experience by increasing the quality of video, in terms of both more definition (UHD, UHD2) and better definition (HDR, HFR, WCG), and also audio (NGA). All this while enhancing compression (HEVC, VVC) and thus making a more efficient use of the spectrum.

2

Seamless access to linear and on demand contents

Blending the benefits of broadcast and unicast networks via HbbTV, DVB-I and 5G Broadcast to bring together live and on demand distribution.

3

A native mobile experience

Enabling the reception of free-to-air broadcast services in increasingly ubiquitous mobile devices, including vehicles, via 5G Broadcast.

Opening the band to new all-IP downlink-only complementary services, including ancillary downlink-only services to licensed media distributors (e.g., scheduled contents) and new downlink-only complementary services (e.g., emergency warning systems) under EU or national flexibility schemes.

1 Enhanced User Experience

○ More image definition (UHD, UHD2)

Sharper and more detailed images, as the amount of data encoded is higher. While HD has currently become the standard viewing mode for most audiences in Europe, UHD is already gaining ground and is widely available in the TV sets. UHD2 is standardized and some hi-end TV sets can display it but widely available native content in UHD2 is still fifteen years further down the line.

○ Better definition (HDR, HFR, WCG)

- **HDR (High Dynamic Range):** improves the contrast between very dark and very light colours on a TV screen. As a result, the image displayed looks brighter, images are more vivid, with greater contrast and a wider array of colours. This means that these images are closer to what people see in real life.
- **HFR (High Frame Rate):** refers to any video shot at more than 24 fps (frames per second), the traditional rate used by cinema. Higher frame rate content gives a much smoother image compared to 24fps. HFR is capable of showing up greater detail within scenes. This is expected to be especially appreciated in certain genres such as sports, where live is an essential part of the experience.
- **WCG (Wide Colour Gamut):** offers a wider range of colours than traditional TV sets.

○ Better sound quality (Next Generation Audio – NGA)

- **Immersion:** offering an immersive audio experience at home without the need of any adaptation of the programme created by the content producer.
- **Personalization:** automated or controlled by the user, the audio stream improves intelligibility and allows for selection of sources, as well as greater accessibility for people with hearing loss, providing a more enjoyable experience.
- **Efficiency:** more efficient than the current generation of audio codecs.



1 Enhanced User Experience

○ Enhanced compression

- **HEVC (High Efficiency Video Coding)**: offers around 50% additional data compression for the same perceptual quality. HEVC was originally published as an ITU standard in 2013. Since then, 8 versions have been published. Transition to HEVC is often linked to a transition from DVB-T to DVB-T2.
- **VVC (Versatile Video Coding)**: offers superior coding efficiency, expected to be able to encode as many UHD streams in a DTT multiplex as HEVC can encode HD streams (Drugeon, 2022). The technology was standardized by the ITU in 2020 but is not yet available in the market. Some markets with recent transitions to HEVC may take longer to move to VVC.



IN PRACTICE

- Between November and December 2022, Spanish public broadcaster RTVE offered 20 matches of the FIFA World Cup in Qatar in UHD and HDR quality free-to-air over Cellnex's DTT network (Fry, 2022). The test covered 60% of the Spanish population.
- Also Polish public broadcaster TVP offers all matches of the FIFA World Cup in Qatar in UHD and HDR quality free-to-air over Emitel's DTT network. The test covers 95% of the Polish population" (Dziadul, 2021).



Seamless access to linear and on demand contents

○ HbbTV (Hybrid Broadcast Broadband Television)

Brings broadcast and broadband services together to the same device, notably connected TVs but also set-top boxes and multiscreen devices. It enables interactive services over broadcast and broadband networks. The standard is supported and developed by a community of varied industry players, including public broadcasters, commercial broadcasters, broadcast network operators, chipset manufacturers, consumer electronics' companies and tech developers, among others.

○ DVB-I (Internet)

Allows seamless switching between broadcast and broadband signals while bringing new features to DTT such as playlists and temporary streams. It allows reception in TV sets but also on mobile devices. Standardised by ETSI in 2020, massive market availability is expected by the end of this decade.



IN PRACTICE

- HbbTV is widely available in most EU countries, including collaborative ventures between public and commercial broadcasters, such as LOVEStv in Spain (Bonet *et al.*, 2021).
- A DVB-I technical pilot is currently running in Germany (Vogel, 2022). In Italy, a precompetitive market trial is scheduled for 2023, when at least 4 manufacturers will offer the first DVB-I enabled TV sets.



3 A native mobile experience

5G Broadcast

Combines the building blocks of 5G with High Power High Tower (HPHT) infrastructure to allow broadcasters target all types of mobile devices, including in-car systems, with free-to-air broadcasts that do not require any gatekeeper, preserving the essence of the European public service broadcast system. All this supported by a thriving and growing community organized around the 5G Media Action Group.

Qualcomm has already shown its commitment to 5G by including it in its chipsets. Furthermore, markets such as China, South Korea, USA, India or Brazil have also shown their interest in this new distribution technology.



IN PRACTICE

- A 5G Broadcast trial in Germany (Beutler, 2022) focuses on infotainment systems in vehicles, showing a better than expected performance at high speeds.
- In Austria (ORS, 2021), 5G Broadcast tests show that:
 - Mobile devices can be used for portable outdoor reception and increase the number of users for terrestrial broadcasting.
 - 5G Broadcast HPHT networks are a supplement for existing DVB-T2 HPHT networks for fixed and portable indoor reception and can coexist with DVB-T2 in the sub-700 MHz UHF band.
 - 5G Broadcast can achieve a comparable performance as DVB-T2 in the future given its potential for development.

The ongoing second phase of this trial focuses on services and applications.

Downlink-only Services

Eventually, there is also the potential to offer massive downlink-only services for regulated media activities and non-media services, including vehicles, IoT and even offloading mobile networks.



The European Cultural Band – Innovation Roadmap

2022



2040

DTT SERVICES

- a. Mixed use of DVB-T and DVB-T2
- b. MPEG-4 as most popular compression standard with HEVC growing and some legacy MPEG-2
- c. Combining HD and SD quality in various degrees according to each country's needs
- d. Initial hybridization with IP services via HbbTV, increasingly popular thanks to massive adoption of connected TV sets

PMSE SERVICES

RADIO ASTRONOMY AND OTHERS

Broadcast uses its dedicated network to deliver mainstream content to large audiences across a wide footprint, while access to on-demand content is made through a separate technical chain with a different user experience and high environmental cost.

DTT SERVICES

- a. All services transmitted in DVB-T2
- b. All services compressed in HEVC or VVC
- c. Combining HD, UHD and UHD2 according to each country's needs
- d. Transparent and seamless hybridization via HbbTV and DVB-I
- e. Closer to real life image thanks to HDR, HFR and WCG
- f. Immersive and personalized sound with NGA

5G BROADCAST

DOWNLINK-ONLY SERVICES

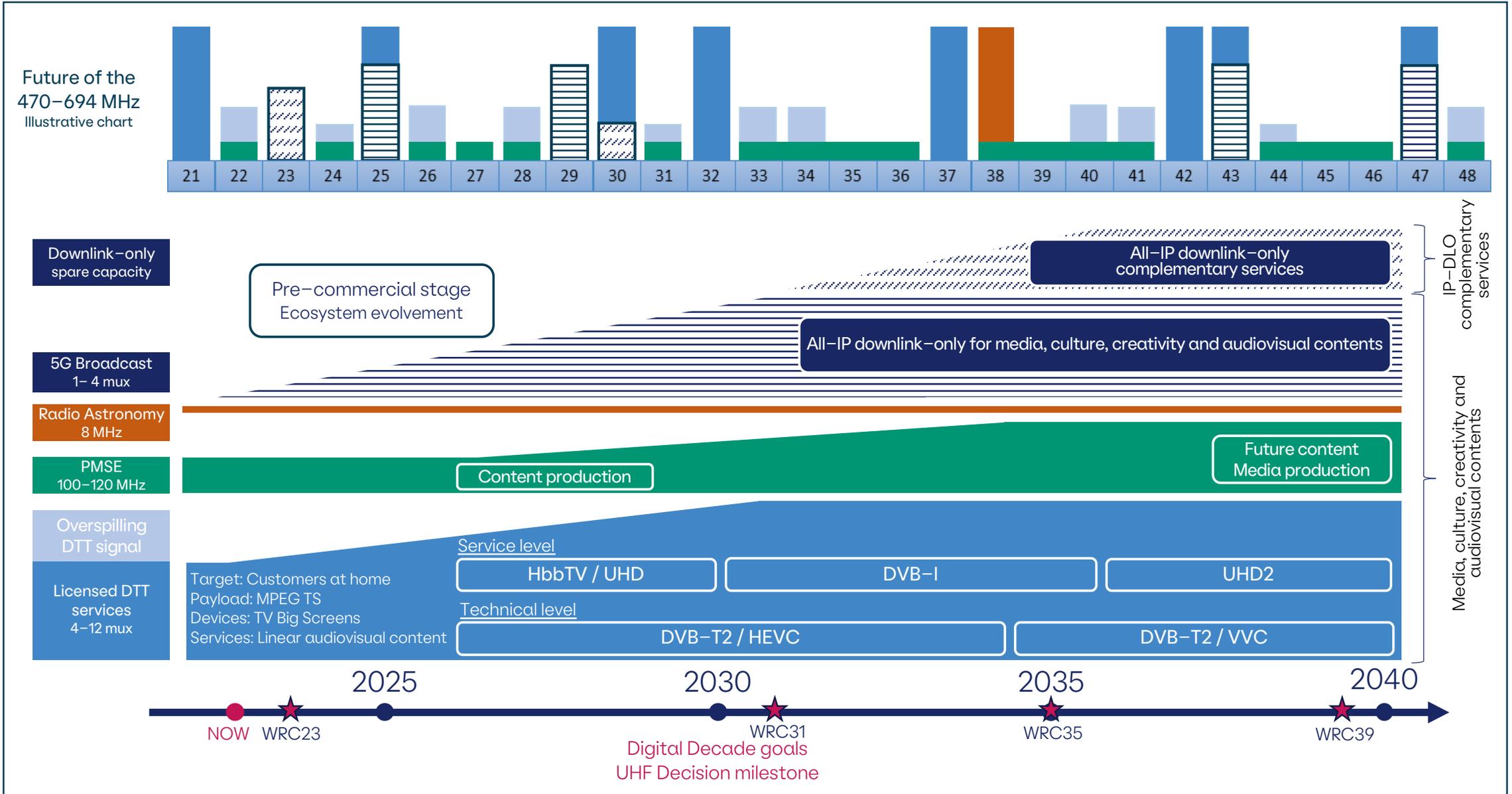
PMSE SERVICES: satisfying increasing demand for cultural and media production via C-PMSE, WMAS and Power Amplifier Linearity.

RADIO ASTRONOMY AND OTHERS

Broadcast delivers mainstream content to large audiences across a wide footprint, blending with unicast technologies for interactivity and personalization as well as for enhancing core services. This vision is adapted to the users' and societal needs, including energy efficiency for audiovisual content consumption.

increased energy efficiency

The European Cultural Band – Innovation Roadmap



Our Commitment

- A long-standing tradition of European broadcast innovation is currently blending with digital technologies to bring the best of both fields together. As such, BNE and broadcast network operators are active members of DVB, 3GPP, 5G-MAG and ETSI.
- This roadmap aims to deliver a continuous flow of innovations to meet the ever-changing and upcoming needs and demands of European citizens. As such, it needs to be adapted in each country by consensus between content editors, broadcast network operators, national regulatory authorities and spectrum managers to meet citizens' needs in an optimal way.
- The broadcast network operators accept this challenge and commit to deliver for European citizens:
 - in an evolutionary way
 - through complementarity of networks
 - building on technical bricks which are either in rollout phase or at least standardized and trialled
 - to provide audiovisual services:
 - wherever and whenever users want, with the level of quality they want,
 - with a business model adapted to public service and commercial needs,
 - in a safe and regulated environment,
 - that deliver public policy goals,
 - compatible with PMSE and other lower UHF band uses,
 - in a sustainable way.
- This innovation roadmap creates the conditions for European-crafted technology to not only continue to shape international markets with the Digital Video Broadcasting (DVB) European family of technologies but also drive the rollout of 5G Broadcast, turning it into another European success story with a global footprint.





How Europe can make it happen

How Europe can make it happen

To build up the European Cultural Band, implement its innovation roadmap and deliver all its potential benefits, we need:

1

Recommending **No Change** to the Council of the European Union regarding the allocation of the 470–694 MHz band in the upcoming WRC–23 and avoiding any further discussion until, at least, WRC–31

2

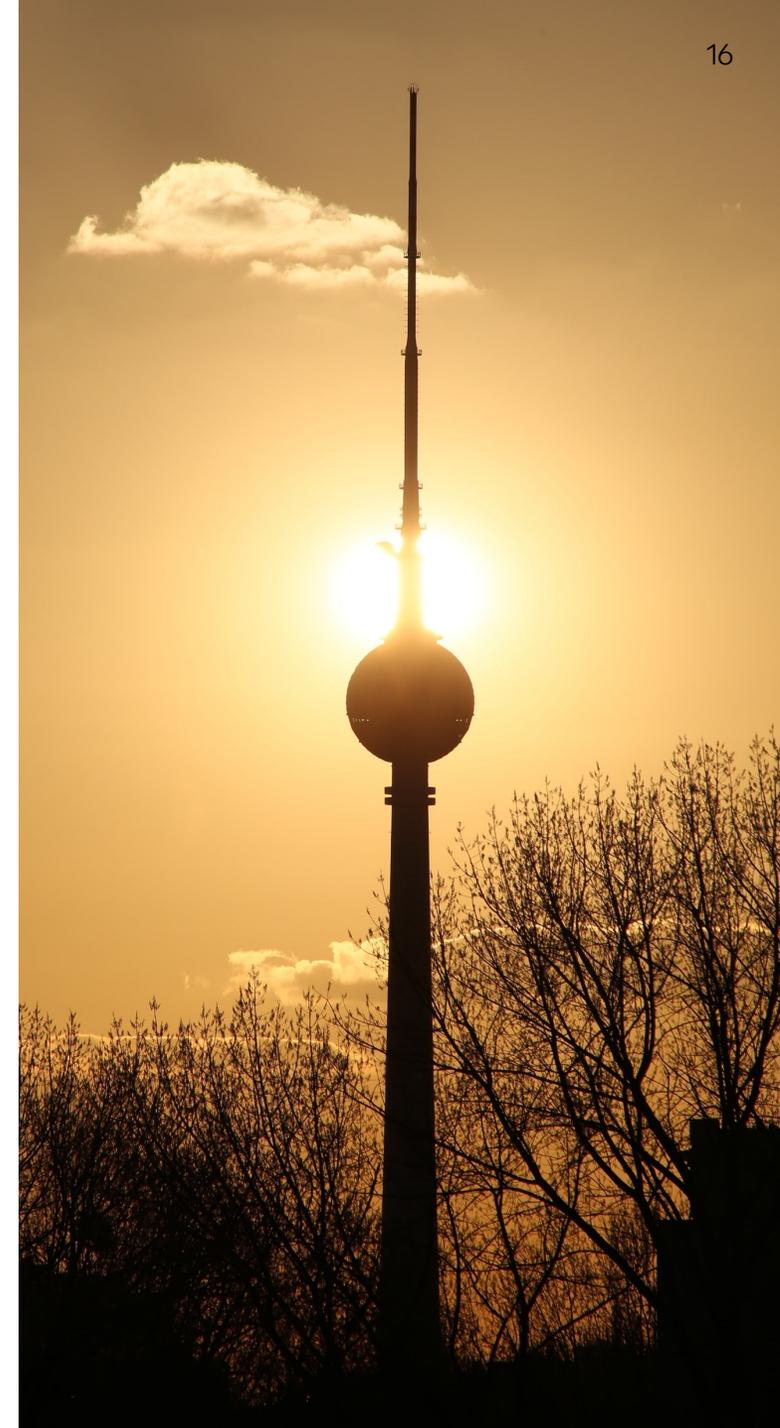
Supporting the innovation in the band:

- Making HbbTV mandatory in TV sets
- Making 5G chipsets supporting 5G Broadcast mandatory in mobile devices, including vehicles
- Requiring mobile network operators to enable free-to-air mode in those devices containing 5G Broadcast chipsets



3

Providing long-term regulatory certainty to business, broadcasters, investors and citizens





European Cultural Band

Benefits

European Cultural Band's Benefits

○ Citizen centric

It brings cultural development and technology innovation together, creating a citizen-centric, free-to-air and universal platform that embodies European values and aspirations. A platform that does not leave anybody behind.

○ Fair competition

It creates a regulated and harmonized ecosystem, securing fair competition, avoiding dominant gatekeeper positions and fostering innovation by national and regional European cultural and media companies.

○ For European businesses

It protects and nurtures existing industries such as DTT and PMSE as well as business and services that are strongly rooted in Europe, representing its diversity and richness and creating jobs and value for the citizens.

○ Platform for European culture

It creates a thriving platform for European cultural and media organizations to distribute their contents and innovate thanks to a clear and harmonized legal framework.

○ Accountability for healthy democracy

It enables a robust, independent and accountable European media system, in which both public service and commercial organizations contribute to build a reliable public sphere and provide trustworthy information that sustains healthy democracies.

○ Public service for all Europeans

It provides the free-to-air platform that enables the fulfilment of public service remit, ensuring universal coverage for everybody.

○ Supporting European content

It creates the opportunity to deploy public policy support schemes for culture and media content creation and distribution, aiming to benefit all citizens and promote territorial cohesion and development.

○ European sovereignty

It offers a secure, resilient and robust distribution platform that reinforces European sovereignty and independence, actively caring for citizen's protection, safety and privacy.

WE
CARE
ABOUT
THE
FUTURE

European Cultural Band's Benefits

● Spectral efficiency

It optimizes spectral efficiency in complementarity with unicast networks: broadcast delivers massively shared experiences more efficiently than unicast, while unicast delivers individual and personalized streams that broadcast is unable to do.

By enabling that both work together, the maximum value and efficiency will be generated.

● Green future for Europe

The European Cultural Band supports a greener future for Europe via:

- Spectral efficiency.
- Less energy consumption than alternative networks.
- Avoiding a compulsory replacement of well-functioning user devices and production equipment that will result in a massive generation of electronic waste and the consequent environmental impact.





What if Europe fails?

What if Europe fails?

● Oligopoly and exclusion

Instead of securing an open, multi-industry, no gatekeeper-controlled ecosystem with a high-efficient use of the spectrum, Europe will witness the creation of an oligopolistic arena in which many industries and players will be excluded due to private foreign interests. This will have a negative impact on media pluralism and diversity, on- and off-screen.

● Industry destruction

Europe will suffer from the destruction of nationally and locally well-rooted industries, high-skilled jobs and value for all citizens.

● Forced hardware transition with no value

Multiple industries and business related to live events, music, theatre, performance, TV and film production will suffer from the negative impact of a forced hardware transition that will not deliver any additional tangible value but rather create the burden of non-harmonized PMSE bands, destroy employment, harm competitiveness and threaten the viability of many European SMEs.

● Weakening European identity

The constriction of the European cultural and media industries will inexorably result in not only the weakening of the European identity and values but also a diminished capability by the cultural, creative and content production sectors to compete against global content offers.

As a result, it is expectable that global players' investment in Europe will consequently decline, only aiming to fulfil the minimal regulatory requirements instead of driving market development, competition and quality standards.

● No direct access to audiences

European cultural and media creators, producers and distributors will lose the platform that secures direct access to all audiences. This will diminish not only their ability to disseminate their own content but also their bargaining power against international distributors and global platforms.



What if Europe fails?

- **Negative environmental impact**

Europe will have to manage an avoidable negative environmental impact, which might compromise its green agenda, and respond to citizens' criticism.

- **Poorer access to trustworthy information**

European citizens will lose access to high-quality and trustworthy information from licensed broadcasters, and thus an indispensable source to build up their opinion and carry out their democratic rights.

This will particularly affect less advantaged social groups that so far have benefited from DTT's universal reach, low cost and ease of access.





Endorses a **No Change** position regarding the allocation of the 470–694 MHz band in the upcoming WRC–23, and demands long–term certainty and regulatory action to support the DTT innovation agenda.

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