



ECC Report 224

Long Term Vision for the UHF broadcasting band

Approved DD Month YYYY

Draft

0 EXECUTIVE SUMMARY

Traditionally, broadcasting and broadband communication services have their own regulations, market structure and typical dedicated network infrastructure (e.g. high power / high tower versus dense networks) in order to provide their respective set of services. The future development of services and terminals has the potential to is-blurring the border between the two “worlds” for the end user and may require innovative approaches to deliver content to ~~the~~ end users in the most efficient way from a technical, economical and social perspective.

The studies contained in this Report identify and analyse possible scenarios for the development of the band 470 – 694 MHz in the long term starting from the existing situation and recognising ongoing studies in the 700 MHz band in Europe, and short to medium term developments (e.g. AI 1.2 of WRC-15 and the response to the European Commission Mandate on the 700 MHz band). The current situation is dealt with in the Report by describing the current role of the terrestrial broadcast platform including issues such as supporting social inclusion and providing information in times of emergencies. In addition, the regulatory framework for the provision of audiovisual media services, the duration of currently assigned TV Rights of Use and current consumption of audiovisual content is also explored in the Report.

The Report addresses the trends in the evolution of services (broadcast, mobile and converged services) to consumers) as well as the networks and technologies that offer with the potential to deliver these services in the band. It includes consideration of the way in which audio-visual content consumption habits may be changing. The most important developments in relation to the evolution of delivery of broadcast services in fixed and mobile environments are also identified. The studies contained in the Report are based on anticipated assumptions made on expected developments for the various current platforms and technologies under consideration and linked to the demand and supply of the envisaged services. Thus, it was necessary to develop relevant indicators in order to monitor the assumptions that align with made on the anticipated -expected developments used for the construction of the future scenarios in the future. These indicators are described in Chapter 5 and are considered suggested as appropriate -suitable for monitoring developments in the future services expected to use the UHF band. Further consideration is required on the measurement and the monitoring of these indicators.

This Report discusses the general classes of scenarios considered by CEPT in defining the long term vision for the band 470-694 MHz. Annex 3 provides a detailed description and the assessment of all the scenarios studied by CEPT. CEPT considers that the following four classes of scenarios could cover the developments in the band 470-694 MHz in the long term:

- **Class A:** Primary usage of the band by existing and future DVB terrestrial networks
This scenario class of scenarios assumes a natural evolution of the DTT platform based on HPHT and/or LPLT networks taking into account ~~the~~ ongoing technological and service developments, and assuming a stable regulatory environment and access to the spectrum.
- **Class B:** Hybrid usage of the band by DVB and/or downlink LTE terrestrial networks
This class of scenarios assumes that broadcast and mobile broadband services in the UHF band would in the future be delivered via LTE SDL/eMBMS, with or without the DTT platform, based on HPHT and/or LPLT networks. The scenarios of this class generally provide additional unicast downlink capacity.
- **Class C:** Hybrid usage of the band by DVB and/or LTE (including uplink) terrestrial networks
This class of scenarios assumes that broadcast and mobile broadband services in the UHF band would in the future be delivered via LTE (including uplink), with or without the DTT platform, based on HPHT and/or LPLT networks. This class corresponds to scenarios where IMT-like unicast uplink and downlink are introduced in the band.
- **Class D:** Usage of the band by future communication technologies
Though most scenarios described herein are derived and based on today’s DTTB and Mobile technologies it is envisaged, that new, more flexible and possibly convergent technologies, will be

developed and implemented in future for the transmission/distribution of audiovisual content in the UHF band.

~~The e~~Whilst cross-border coordination and coexistence ~~is one element of the assessment and~~ is addressed in chapter 6 of the Report based on the above mentioned classes, ~~this only touches on one of the many critical aspects that would need to be considered before a significant change in policy / approach would be appropriate.~~ The additional aspects for consideration, e.g. economic, social, regulatory, migration aspects, etc., have been outlined in the work and would need to be explored in any future study.

~~The main conclusions of the studies are stated below.~~

In relation to the evolution of delivery of broadcast services in fixed and mobile environments the following important developments are expected to continue:

- Broadcasting services will continue to evolve, as can be seen by improvements in picture quality and user experience through the introduction of HDTV, UHDTV, 3DTV, etc;
- Linear viewing will remain the main way of viewing TV content for the foreseeable future. Time-shifted and on-demand (non-linear) viewing will continue to grow, driven by services such as YouTube, Netflix, BBC iPlayer and Boox TV;
- Currently the majority of TV viewing, both linear and non-linear, occurs in the home and this will not change. Viewing outside the home is growing but it will remain marginal compared within-home viewing;
- Most TV viewing will remain on large screens, while viewing on handheld devices will increase. In the home, the latter will be driven by the growing availability of WiFi;
- Migration of services from SDTV to HDTV, and the introduction of additional HDTV services;
- The content offering will continue to increase;
- In many European countries, HDTV programmes are already offered on the DTT platform, and this could be expected to become the norm in the short to medium term. In order to allow these services to be delivered efficiently to viewers, the DTT networks need to continue to evolve and have access to a sufficient amount of spectrum;
- Hybrid broadcast-broadband services will become commonplace, possibly including a wireless broadband element, to allow increased access to non-linear as well as linear content;
- Evolutions in DTT technology will support larger SFNs therefore increasing efficient use of spectrum;
- European Digital Agenda (DAE) objectives will lead to improved broadband capacity supporting improved availability of IPTV;
- LTE, through its Broadcast and eMBMS applications, will be able to deliver broadcast and multicast content ~~subject to further enhancements to the standard.~~ In addition, it was noted that mobile radio systems are not as spectrally efficient as DVB standards;
- New mobile devices, tablets and smartphones, facilitate a better user experience for mobile TV content consumption.

The main conclusions of the studies are stated below.

Content, which could be traditionally seen as typical broadcast content (i.e. audiovisual content ~~like such as~~ videos ~~or~~ music) is also available ~~in-on~~ the internet and distributed via cable, optical fibre or wireless broadband access. On the other hand, broadcast services are more and more ~~heading making use of~~ ~~for using~~ reverse channels or additional parallel channels to allow the user more flexibility and access to additional information. **A cooperation between radiocommunication services is expected ~~on-ain~~ the long term.**^[PC1]

Traffic expectations for broadcast service and broadband access, including wireless, are mainly based on the increasing delivery of audiovisual content in improved quality to an increasing number of users. This will result in a higher traffic asymmetry.

Due to its propagation characteristics, the band 470-694 MHz can be efficiently used for the distribution of audiovisual services. These services may be linear or non-linear. The number of receiving users served by a content provider can vary from one to up to several million users. This is depend~~anting~~ on the different types of content, user density, the specific social and economic situation, and technology. **Therefore, the long**

term usage of the band 470-694 MHz is, mainly, foreseen for downstream audiovisual content distribution.

The scenarios listed in Annex 3 and classified in Section 6 describe possible long-term future deployments in the band 470-694 MHz. Each of these scenarios has a certain potential to occur. With the current state-of-the-art of the radiocommunication technologies, there are incompatibilities between some scenarios. Most notably the implementation of class C appears technically difficult and challenging due to the incompatibilities at the border with countries implementing class A or B. Whilst class D is currently undefined. However, the situation as of today may change in the long term.

The variety of scenarios considered in this report should be understood as an indication for different needs/requirements in different countries regarding the future use of the band 470-694 MHz.

In order to facilitate different scenarios considered by the CEPT for the usage of the band 470-694 MHz, it could be necessary to introduce more flexibility in the regulatory environment governing the use of this band. ~~It should among others take account of possible~~ This would be subject to future advances in radiocommunication technologies far beyond the current situation ~~to allow the as well as of~~ different needs and requirements in different countries to be accommodated. To avoid interference issues between administrations and inefficient usage of spectrum, the compatibility between scenarios has to be taken into account.

There could be different measures to provide for the regulatory flexibility in the band 470-694 MHz, if so required. It should be pointed out that any modification of the Radio Regulations to ~~implement increase~~ flexibility has to be discussed in the framework of ~~the~~ ITU, taking into account the inherent existing flexibility of both the Radio Regulations and the GE06 Agreement.

Overall, it is suggested that the following non-binding elements may assist administrations when deciding on a particular scenario for the usage of the band 470-694 MHz:

- the current national interest objectives;
- the implications of a given scenario on the audiovisual industry, content creation and user expectations;
- monitoring of the market and technological developments by means of the key indicators as defined in Chapter 5;
- the cost/benefit analysis with a focus on the impact on consumers;
- assessment criteria such as but not limited to those that were used in the assessment of the scenarios listed in Annex 3;
- a realistic time frame for the transition towards a new scenario, taking into account duration of the existing rights of use and the spectrum needs during the transition period as well as the need for continuation of the service (in the context of this report);
- the necessity for cross-border coordination;
- the national legal and regulatory framework.