TECHNICAL ASSISTANCE PAPER

"700 MHZ BAND DE-ALLOCATE IN ALBANIA"

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1. EXECUTIVE SUMMARY

The purpose of this documentation is to provide an overview of the future of digital terrestrial television. Television is both a communications and an audiovisual media service, it must meet the requirement of the competitive market and the demands of the state. Terrestrial television is the only platform that reaches all the inhabitants of the country and provides basically vital information to them. This platform that can ensure the sovereignty of the country in case of emergencies or disasters.
The aim of the study is to review all possibilities to de-allocate a 700 MHz band while terrestrial TV programs are available in unchanged quantity and quality. The review should identify which can and cannot be used for Albania. Of course, the existing conditions must be taken into account (e.g. the status of frequency coordination, authorization procedure) if the task seems unsolvable, the previous procedures and methods will be reviewed and new ones will be proposed.
The infocommunications overview shows the direction which technology is evolving and how it helps to achieve the planned goals. The audiovisual review is based on the present needs of the public service. However, should be note that new services (for example HbbTV) or new solutions (4k) are often tested by public service television and then the innovation introduced nationwide. Public service television can be one of the drivers of innovation in the field of television.
Terrestrial television is very popular platform in Albania and all available frequencies have been used for this purpose. The country has now switched from analogue technology to state-of-the-art digital technology (DVB-T2). The digital-to-digital transition that several countries have gone through has been avoided by Albania which can be an advantage. The problem is that used bandwidth in the UHF band must be reduced so that viewers can reach the usual TV programs in the future. The terrestrial broadcasting is not established on a single infrastructure, so the situation is not optimal in terms of frequency. The proposed use of shared infrastructure could be one of the solutions.
The other solution is to extend the allotments and, as a result, make more optimal use of the available bandwidth. This requires speeding up the international frequency coordination with neighbouring countries. It is recommended that frequency coordination experts be involved by the ITU twining program who have access to planning software and can process Albanian coordination data. This will help develop a strategy for frequency coordination negations.

The combination of the two proposed solutions can lead to the desired result. The time is scarce because we need to calculate the time of implementation for operators (1 year). The action plan was prepared accordingly.

The development of both broadcasting and mobile communications is a strategy of importance to the country. 700 MHz frequency coordination affects broadcasting and MFCN at the same time. Strategic goals can be achieved with the cooperation of the authorities AMA and AKEP. It is important that they carry out all the necessary operational tasks on time within their own competence.
The complexity of the task requires that it be coordinated and supervised by the ministry, MIE.

2. MAIN GOAL

The 700 MHz band currently used by terrestrial TV broadcasting should be released by 30th July 2020. The quantity (number of the TV channel) and quality (SD or HD) of audio-visual content will not change in the next period, so the capacity currently used must be taken into account.

3. Institutional Framework in terms of terrestrial TV broadcasting (Albania)

Ministry of Infrastructure and Energy (MIE) - policy making for telecommunication:

- DCoM no. 504 dated 13.09.2017, "On the definition of the field of responsibilities of the Minister of Infrastructure and Energy", the Minister of Infrastructure and Energy is in charge for telecommunication area as policymaking.
- Main tasks and role as it is given in the electronic communication law;

Audio visual Media Authority (AMA) – independent regulatory body for audiovisual media

Main tasks and role as it is given in the audiovisual media law (Law no 97/2013);

Authority for Electronic and Postal Communication (AKEP) – independent regulatory body for electronic communication market;

- Main tasks and role as it is given in the electronic communication law;

4. INTERNATIONAL OUTLOOK (BROADCAST AND MEDIA TECHNOLOGY)

4.1 Lamy report

Pascal Lamy was the first who analysed the future of the UHF band in Europe and published the results in 2015. This analysis showed that viewers in different countries have different access to television content. The difference depends not only on the economic level, media or infocommunication market development of the given country, but is also based on cultural traditions.

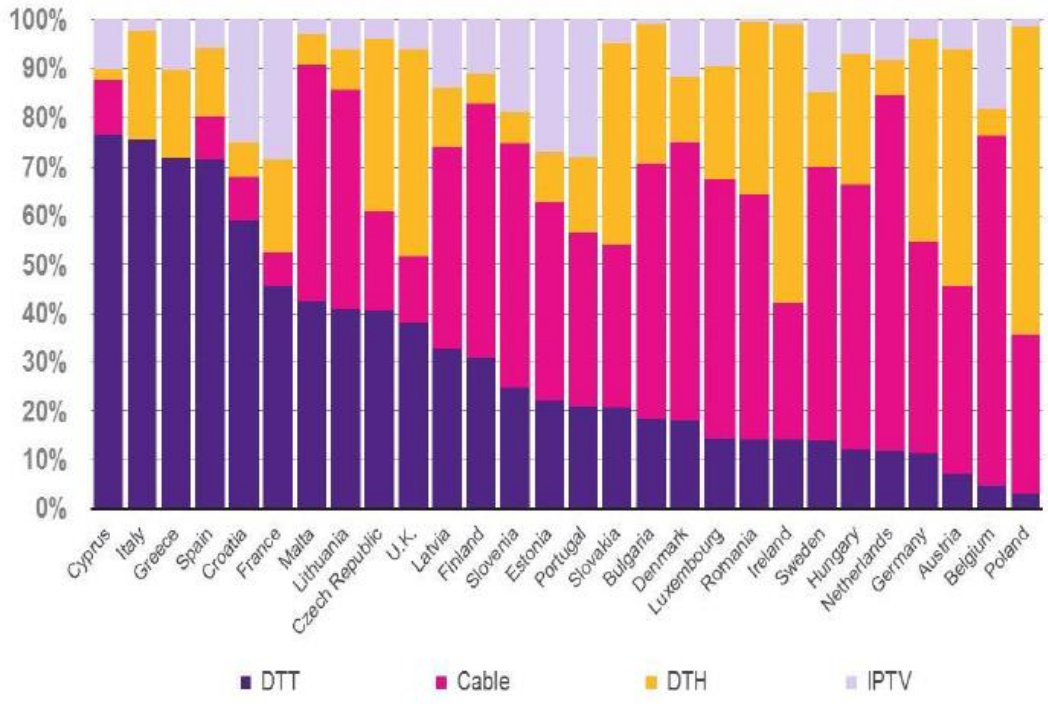


Figure 1: Market shares of television platforms across Europe in 2015

[Source: Pascal Lamy report 2015]

4.2 IABM report

The IABM published its report on broadcasting technological change and its background In August 2020. This report confirms that the European broadcasting market remains fragmented, consisting of different countries with different languages, cultures and economies. Every country in Europe typically has a large state-funded public broadcaster, various commercial broadcasters and often several pay-TV providers. These market players produce their own content and offer a wide range of regional and international content that needs to be localized.

4.3 Platforms

According to Digital TV research, despite strong competition from other modes of transmission, in 2019, cable remained the most popular distribution platform in Europe, followed by IPTV and satellite (DTH). IPTV is growing in popularity - in 2015, it surpassed satellite TV in revenue and is expected to surpass cable by 2023.

Today, cable and satellite TV are the dominant broadcasting infrastructure in Northern Europe, while Southern European countries are more dependent on terrestrial transmission. France may be an exception to this, as the majority of French TV households are connected to IPTV.

The European market can roughly be divided into three sub-regions, based on broadcasting and economic fundamentals. The partitioning is based on geographical location and therefore includes both EU and non-EU countries:

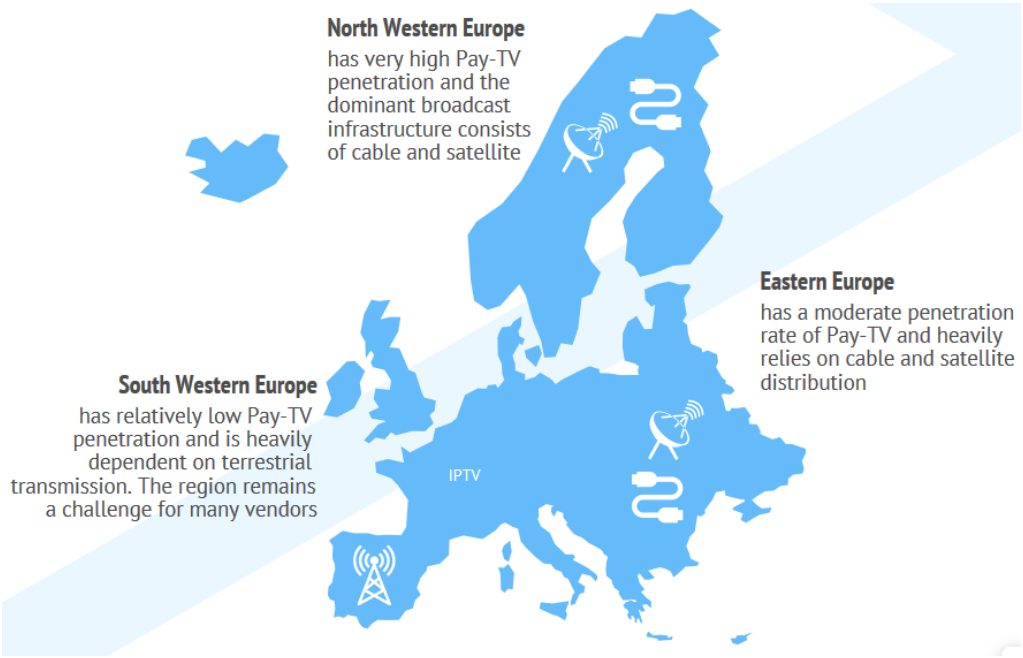


Figure 2: Market shares of television platforms across Europe in 2020

[Source: IABM report August 2020]

4.4 Digital switchover

The transition to digital broadcasting has been completed in most European countries. The digital switchover in Europe gave rise to a number of multiplex operators, who use the own or leased spectrum and deliver the content on behalf of multiple broadcasters. Generally, one or two primary multiple operators are present in many countries. The size and scale of a typical national multiplex operator, as well as their predictable cash flow from long-term contracts with broadcasters, depend on the opportunity of the international expansion.

4.5 DVB-T2

While the transition to digital broadcasting has been completed in most European countries, 14 of the 32 European countries have also completed the transition to the more advanced digital terrestrial broadcasting standard, DVB-T2.

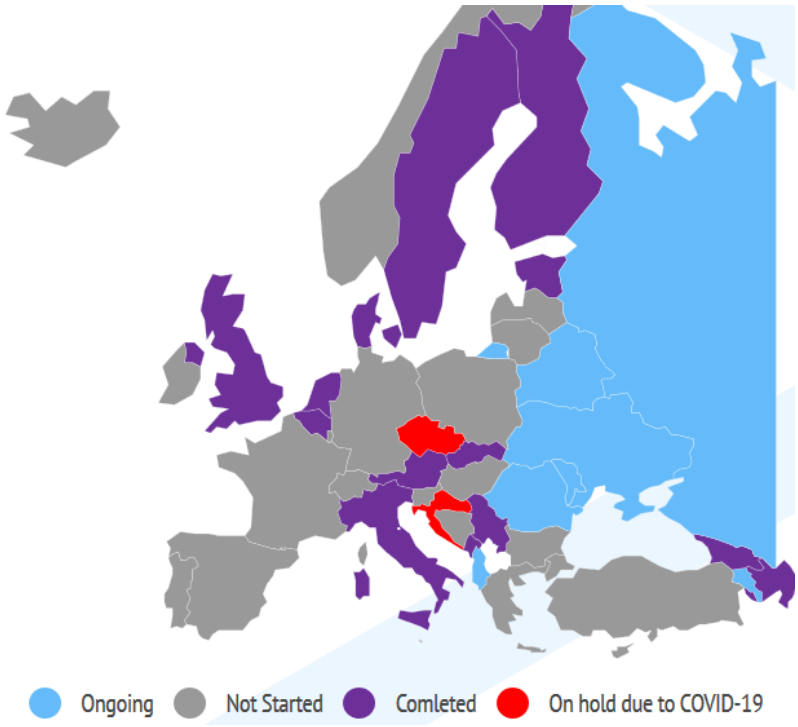


Figure 3: Transition to digital broadcasting in Europe

[Source: ITU 2020]

In countries that have not yet started the transition to DVB-T2, most of the transition to the previous DVB-T standard has been completed, but Bosnia and Herzegovina is still ongoing. Turkey is the only country that has not yet started the transition to digital transmission.

4.6 UHD

4K / UHD television has been present in Europe since 2005, but the emergence of new technologies (DVB-T2, HEVC) can make it a success. According to a recent SES survey, 15% of European households had UHD television in 2019. More and more content is available from dramas to live sports in 4K format.

5. NATIONAL OUTLOOK (BROADCAST AND MEDIA TECHNOLOGY)

One of the products of the preparation of this document is that the AMA has prepared a terrestrial TV spectrum demand answer in preparation for ITU WRC23. This paragraph is based on this document and the analysis is based on it. The extended answer for ITU circular letter R00-SG06-CIR-0104!!MSW can be found in the annex.

Albania is one of the countries where terrestrial TV has a large market share. 90% of Albania's population is covered and 80% of households access media content through the terrestrial TV platform. The popularity is also due to the fact that there are currently 7 multiplexes offering different content at national level. At national level, 10 HD + 13 SD FTAs and 25 HD + 54 SD Pay

TVs are available, which offer a very rich and competitive program selection compared to other platforms.

6. THE VALUE CHAIN OF TERRESTRIAL BROADCASTING

Digitization has changed the value chain of broadcasting, expanding it with new opportunities. It gives the content provider more options for copyright protection of the content. New types of services may also appear, such as HbbTV. The figure shows the different elements of the value chain.

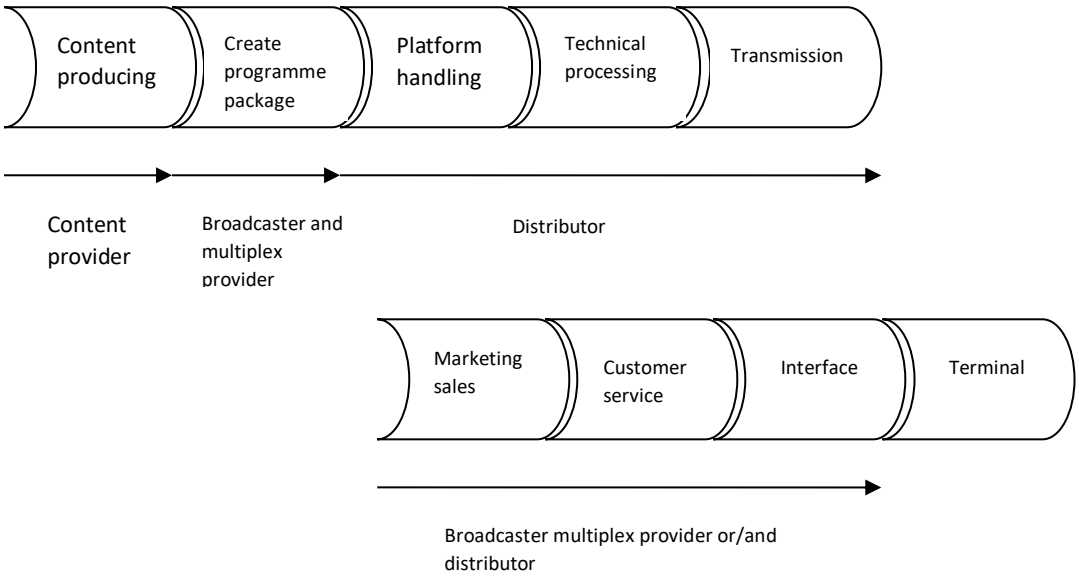


Figure 4: The value chain of digital television

[Source: own]

The functions how it can be implemented depend on regulation. The task is how we can ensure the competition in the audio-visual and infocommunications markets.

The functions also can be implemented in a different way in case of national, regional or local broadcasting.

From the point of view of the audio-visual market, the content of public service broadcaster needs to be handled separately. The fundamental interest of the state is to deliver to the viewers, so these contents are subject to the “must carry” rule. Of course the question is that the how many TV channels the state wants to provide to citizens and what kind of resolution (SD/HD). This decision is made by the state through its administration (ministry, authority). Anyway, the state can decide to

entrust public broadcaster with a given function (e.g. multiplex function) based on the value chain and the public broadcaster has a right to define the number of channels and the resolution. For example, the state authorizes public service broadcaster to compile one or two multiplexes. The public broadcaster is acquainted with the capacity of the multiplex (Mbit/s) and loads the multiplex with its own (SD/HD) TV channels.

It should be noted, that there are two goals confront each other, where both goals are very important and necessary to find a balance between them.

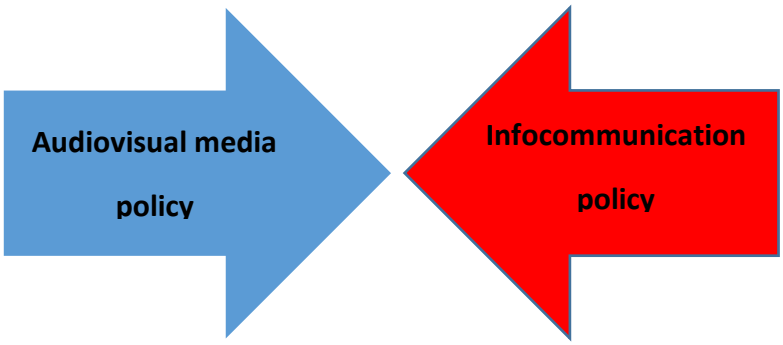


Figure 5: *Balance between the Media and Telco markets*

[Source: own]

The audiovisual policy is very important. The own language, culture and art of the country must be preserved and developed.

Equally important is the development of the infocommunications sector and the introduction of 5G mobile broadband technology in the country. New technologies will increase the country's competitiveness such as rising GDP, new jobs. The next-generation mobile technology (5G) opens up new horizons for digital economic and business models.

This state of equilibrium must be determined by the represent of the state, in which no external advice can be given. Based on the number of achieved national multiplexes due to the frequency coordination, the number of the public broadcasting multiplexes or the requirement capacity of public broadcasting programs may reconsidered.

7. MODEL (national, regional)

Strong multiplex model

The state defines how many TV channels it wants to provide to citizens and in what kind of resolution (SD/HD). (Must carry rule.) From these, a capacity requirement can be calculated (Mbit/s). Reducing all available multiplexes capacity to the remaining capacity (Mbit/s) will be available for commercial TV channels. The multiplex operator will decide about the available TV channels considering the capacity of the multiplexes (Mbit/s). Operator wants to create an attractive program package due to the competition with other platforms like DTH.

Weak multiplex model

The state defines how many TV channels it wants to provide to citizens and what kind of resolution (SD/HD). (Must carry rule.) From these, a capacity requirement can be calculated (Mbit/s). Reducing all available multiplexes capacity to the remaining capacity (Mbit/s) will be available for commercial TV channels. The commercial TV channels which will be available in the multiplex is tendered by the ministry or authority. The state entrusts a service provider with the transmission of the multiplexes. This service provider can be selected by commissioning e.g. by state own service provider or by competition.

8. MODEL (regional, local)

Sometimes, at local level, there is no demand for local broadcasting. Frequency should be coordinated and provided for local broadcasting only based on demand. If there is a local demand for one TV channel in this case there is no competition for the use of the capacity of the local multiplex. The public service broadcaster may request the broadcasting of its content in the regional multiplex at regional level. At local level, this is not typical. If only one TV channel occupies the local multiplex (its full capacity) then we can use more robust system parameters with lower transmit power.

A different model can be applied for each layer, which was defined by frequency coordination. However, this means that capacity optimization is done on a multiplex basis and not on the capacity provided by the entire frequency set. One of the main reasons for multiplex optimization may be that infrastructure sharing is not allowed by regulation or is not established on a market basis. Both cases lead to inefficient use of the frequency assets available to the state.

9. LICENSING (audio-visual media, infocommunication)

The issue of licensing is partly related to the models.

In case of national or regional multiplex

One of the market players in the value chain has the license to provide audio-visual media service. Similarly, one of the market players in the value chain has a license to operate the infocommunications network. The frequency license may belong to this market player or may belong to the company who operates the TV transmitter.

In case of regional or local multiplex

At local and maybe regional level, the licensee and the operating company are usually the same. Nevertheless, it must have the necessary license to produce audio-visual content and have an infocommunications license, including a frequency license.

10. BANDS (VHF, UHF)

The digital terrestrial TV broadcasting frequency plan (called GE06) was accepted on RRC06. This plan sets out frequency plans in the VHF and UHF bands for Europe, the Middle East and Africa countries. Previous analogue frequency plans (ST61) have been replaced by GE06 and nowadays analogue TV transmitters are no longer protected and cannot interfere with digital TV transmitters. The frequency plan for digital broadcasting provides the following for Albania:

- 7 national coverages with DVB-T (Digital terrestrial television) in UHF band
- 1 national coverages with DVB-T in VHF band
- 2 national coverages with T-DAB (digital radio) in VHF band

Although it is possible to use both bands on both the transmitter side and the reception side, digital broadcasting started only in the UHF band. The reason of it maybe the VHF band requires larger antennas on both the receiver and transmitter side. The lower RF bandwidth also means less capacity, on the other hand, it is less suitable for regional or local TV broadcasting. Several European countries have performed band conversions by converting 1 TV layer to 3 T-DAB layers. Note that this is a one-way conversion. T-DAB layers cannot be converted back to DVB-T layers after the decision.

European countries haven't launched digital terrestrial TV broadcasting in the VHF band. If Albania would like to launch a terrestrial TV network or transmitter, necessary to launch the frequency coordination with neighboring countries for given TV transmitter site based on defined procedure by GE06 plan. VHF band coordination was not on the agenda for any administration of European countries. On the other hand, the lower frequency (VHF) requires more effective coordination with more "neighbouring" countries than the UHF band.

In summary, the UHF band is available for digital TV broadcasting in practice at the national, regional or local level.

10.1 DD1

WRC 07 identified the 790-862 MHz band for mobile in Europe, the Middle East and Africa. WRC-07 decided to allocate the upper part of the UHF band, 790-862 MHz, to the mobile service and to identify it for IMT worldwide.

The digital dividend is a viable opportunity to extend the coverage of wireless broadband networks in sparsely populated areas, as well as indoors.

WRC-07 did not suppress the existing allocation to terrestrial broadcasting in all three ITU Regions in the corresponding parts of the UHF band. It did not suppress either the previously existing allocations to the mobile service and to the aeronautical radionavigation service, which are still in use in some countries.

- The frequency band 790-862 MHz has been allocated to the mobile service on a primary basis in a number of countries in Region 1 for more than 20 years subject to provisions of RR 5.316;

- WRC-07 allocated the band 790-862 MHz to the mobile service on a primary basis in additional countries in Region 1 from 1 January 2009 subject to the provisions of RR 5.316A;
- WRC-07 allocated the band 790-862 MHz to the mobile service on a primary basis in the whole of Region 1 from 17 June 2015 subject to the provisions of RR 5.316B and identified this band for IMT (see RR 5.317A)

WRC-07 allocated on a primary basis the 790-862 MHz band to mobile services in Region 1 as from 17 June 2015, and in some CEPT countries it is possible to utilise this band for mobile services before 2015, in accordance with the provisions of the Radio Regulations. The 22nd meeting of ECC (Vienna, March 2009) agreed to develop a Decision on harmonised technical and regulatory conditions in the band 790 - 862 MHz in order to meet the needs of industry and administrations.

Figure 6: *Harmonised 800MHz band plan*

[Source: Analysis Mason, 2012]

European Commission Decision of 6 May 2010 on harmonised technical conditions of use in the 790-862 MHz frequency band for terrestrial systems capable of providing electronic communications services in the European Union. They adapted the following in this decision:

- Member States shall ensure that systems referred to in paragraph 1 give appropriate protection to systems in adjacent bands.
- Member States shall facilitate cross-border coordination agreements with the aim of enabling the operation of systems referred to in paragraph 1, taking into account existing regulatory procedures and rights.
- Member States shall not be bound to implement the obligations under this Decision in geographic areas where spectrum coordination with third countries requires a deviation from the parameters set out in the Annex to this Decision, provided that they notify the relevant information to the Commission, including the affected geographic areas, and publish it pursuant to Radio Spectrum Decision. Member States shall make all practicable efforts to resolve such deviations and inform the Commission thereof.

Member States shall keep the use of the 800 MHz band under scrutiny and report their findings to the Commission upon request. The Commission shall, were appropriate, proceed to a review of this Decision.

In Europe, spectrum issues are discussed through the following process:
• The Radio spectrum Policy Group (RSPG), provides the opinion of the 27 EU Member States to the European Commission (EC).
• On this basis, the EC issues mandates to the CEPT (the European conference of Posts and Telecommunications administrations, formed by 46 Member States) to provide technical conditions on the use of spectrum.
• Once received by the EC, these conditions are integrated into recommendations (not binding on EU Member States) or decisions (binding), after consultation of the Member States.
• The process also involves the European Council of Ministers and the European Parliament.

Although this decision is not binding on EU Member States, it may soon become such as a result of the recent resolution of the initial difficulties with aeronautical radionavigation in Eastern Europe and once complete transition to digital television broadcasting has been achieved, i.e. by the GE06 Agreement deadline of 17 June 2015.

The technical considerations regarding harmonization options for the digital dividend in the European Union are described in CEPT reports.

Within the framework of the CEPT, a channel allocation plan for the use of the 790-862 MHz band by the mobile service has been developed and recorded in Decision ECC / DEC / (09) 03.
The harmonised frequency arrangement is 2 x 30 MHz with a duplex gap of 11 MHz, based on a block size of 5 MHz, paired and with reverse duplex direction, and a guard band of 1 MHz starting at 790 MHz. The FDD downlink starts at 791 MHz and FDD uplink starts at 832 MHz.

790-791	791-796	796-801	801-806	806-811	811-816	816-821	821-832	832-837	837-842	842-847	847-852	852-857	857-862
Guard band	Downlink						Duplex gap	Uplink					
1 MHz	30 MHz (6 blocks of 5 MHz)						11 MHz	30 MHz (6 blocks of 5 MHz)					

The international regulatory framework for the digital dividend was further refined by WRC-12, in the following manner:

• it has clarified that no additional regulatory measures need to be taken to protect the broadcasting service in one country from the mobile service in another country,

• its preparation to address compatibility issues between the mobile service (IMT) and the aeronautical radionavigation service allocated in a number of Eastern European countries has led to the conclusion of bilateral agreements which resolve these issues and ensure availability of the 800 MHz band in all European countries,

• the misalignment in the mobile allocations of the digital dividend spectrum between the three ITU Regions has been corrected, by allocating the band 694-790 MHz to the mobile, except aeronautical mobile, service in Region 1 and identifying it for IMT.

Subject to confirmation by WRC-15, this provides a worldwide mobile allocation and identification for IMT in all three Regions in the band 698-862 MHz.

10.2 DD2

The WRC-12 accepted Resolution 232 about the use of the frequency band 694-790 MHz by the mobile, except aeronautical mobile, service in Region 1 and related studies.

The resolution resolves:

1 to allocate the frequency band 694-790 MHz in Region 1 to the mobile, except aeronautical mobile, service on a co-primary basis with other services to which this band is allocated on a primary basis and to identify it for IMT;

2 that the allocation in *resolves* 1 is effective immediately after WRC-15;

3 that use of the allocation in *resolves* 1 is subject to agreement obtained under No. **9.21** with respect to the aeronautical radionavigation service in countries listed in No. **5.312**;

4 that the lower edge of the allocation is subject to refinement at WRC-15, taking into account the ITU-R studies referred to in *invites ITU-R* below and the needs of countries in Region 1, in particular developing countries;

5 that WRC-15 will specify the technical and regulatory conditions applicable to the mobile service allocation referred to in *resolves* 1, taking into account the ITU-R studies referred to in *invites ITU-R* below.

At ITU level, the first session of the Conference Preparatory Meeting established, on an exceptional basis, a Joint Task Group 4-5-6-7 (JTG 4-5-6-7) to carry out the preparatory studies on WRC-15 Agenda items 1.1 (which deals with the need for additional mobile broadband spectrum in general) and 1.2 (which deals with proposals relating to the second digital dividend in particular). JTG 4-5-6-7 has so far held two meetings. The second meeting was held in Geneva on 21–28 November 2012 and involved 280 delegates and received 67 input documents including liaison statements from concerned groups, proposals for frequency bands to be studied, elements for sharing studies and proposed text for the Conference Preparatory meeting, which meets twice between each WRC.

The new mobile allocation is to be made from 694–790MHz, and is proposed to come into force in 2015. The delay to 2015 is in order to enable the necessary technical studies to be concluded regarding the availability and assignment of the new band, before bringing the band into use. This 'second digital dividend' in ITU Region 1 is adjacent to the first digital dividend at 800MHz (from 790-862MHz), which was put into placed at the previous WRC, in 2007 (WRC-07).

Clearing the 800 MHz frequency band reduced the UHF spectrum available for terrestrial television broadcasting by 18%. The 700 MHz frequency band means 30% of the UHF TV spectrum left after clearing the 800 MHz frequency band, the utilisation of which for other purposes will have a big impact on currently operating terrestrial digital television (DVB-T) networks.

In order to avoid a decrease in broadcasting capacity by utilising the 700 MHz frequency band for purposes other than broadcasting an upgrade from the existing DVB-T broadcasting technology to DVB-T2 and a significant replanning and restructuring of the network and its international coordination is necessary.

The GE06 Agreement provides the applicable regulatory procedures for cross-border coordination. CEPT Report 30 identifies restrictive technical conditions through the concept of Block-Edge Masks (BEMs), which specify the permitted emission levels over frequencies inside and outside the licenced block of spectrum, respectively.

At the European level, the European Commission issued a mandate to CEPT in March 2013 to develop technical conditions for the introduction of wireless broadband in the 700 MHz band in the European Union (EU) while ensuring appropriate protection for incumbent uses, primarily broadcasting services and PMSE, and taking into account other priority areas of EU spectrum policy such as public protection and disaster relief. Addressing the European Radio Spectrum Policy Group shortly before the CEPT mandate was published by Neelie Kroes, Vice-President of the European Commission responsible for the digital agenda said *"I want to find a sustainable long-term solution for this band — that is my commitment. There is huge potential in international harmonization. So I want to avoid a fragmented approach, balance the interests of incumbent and new users, and deliver the greatest possible benefits for Europe, economically and socially."*

After lengthy international preparations, the topic of releasing the 700 MHz frequency band is now at a stage where Decision (EU) 2017/899 of the European Parliament and the Council published on 17 May 2017 on the use of the 470-790 MHz frequency band in the Union.

The Decision, therefore, does not only relate to mobile broadband communication but it also has a strong influence on the future of terrestrial television broadcasting. The issue of utilising the 700 MHz frequency band relates to a number of strongly interrelated processes of frequency management and a number of frequencies used by industries (e.g. media, emergency organisations, healthcare, transportation). It is extremely important that the regulation should equally meet market, government and social expectations.

Based on the Decision, terrestrial systems capable of providing electronic communication services (MFCN) other than broadcasting must be introduced in the 700 MHz frequency band; therefore, television broadcasting networks need to be replanned within the framework of existing international agreements. The new frequency plan must receive the consent of the administrations of the affected countries. The coordination request containing the technical parameters of the transmitters must be sent to the countries within the coordination contour created using the calculation method as defined in the Final Acts of the Regional Radiocommunication Conference held in Geneva, 2006. The Final Acts does not specify any strict evaluation criteria; therefore, before the new network plans are coordinated, it is important that all countries determine coordination principles together with the other countries concerned.

Decision (EU) 2017/899 of the European Parliament and of the Council regulates the implementation duties and other member state obligations for the 700 MHz band, and also includes provisions for the 470-694 MHz frequency band:

- By 30 June 2020, Member States shall allow the use of the 694-790 MHz ('700 MHz') frequency band for terrestrial systems capable of providing wireless broadband electronic communications services only under harmonised technical conditions established by the Commission pursuant to Article 4 of Decision No 676/2002/EC.
- Member States may, however delay allowing the use of the 700 MHz frequency band for up to two years on the basis of one or more of the duly justified reasons set out in the Annex to this Decision. In the case of such a delay, the Member State concerned shall inform the other

Member States and the Commission accordingly and shall include those duly justified reasons in the national roadmap adopted pursuant to Article 5 of this Decision. Where necessary, Member States shall carry out the authorisation process or amend relevant existing rights to use the spectrum in accordance with Directive 2002/20/EC, in order to allow such use. A Member State that delays allowing the use of the 700 MHz frequency band under the second subparagraph and the Member States affected by that delay shall cooperate with each other with a view to coordinating the process of releasing the 700 MHz frequency band for wireless broadband electronic communications services and shall include information on such coordination in the national roadmaps adopted pursuant to Article 5.

- In order to allow the use of the 700 MHz frequency band in accordance with paragraph 1, Member States shall, by 31 December 2017, conclude all the necessary cross-border frequency-coordination agreements within the Union.
- In order to ensure that the use of the 700 MHz frequency band is in accordance with Article 1(1), Member States shall include in their national roadmaps, where appropriate, information on measures, including any support measures, to limit the impact of the forthcoming transition process on the public and on wireless audio PMSE use and to facilitate the timely availability of interoperable television broadcasting network equipment and receivers in the internal market.

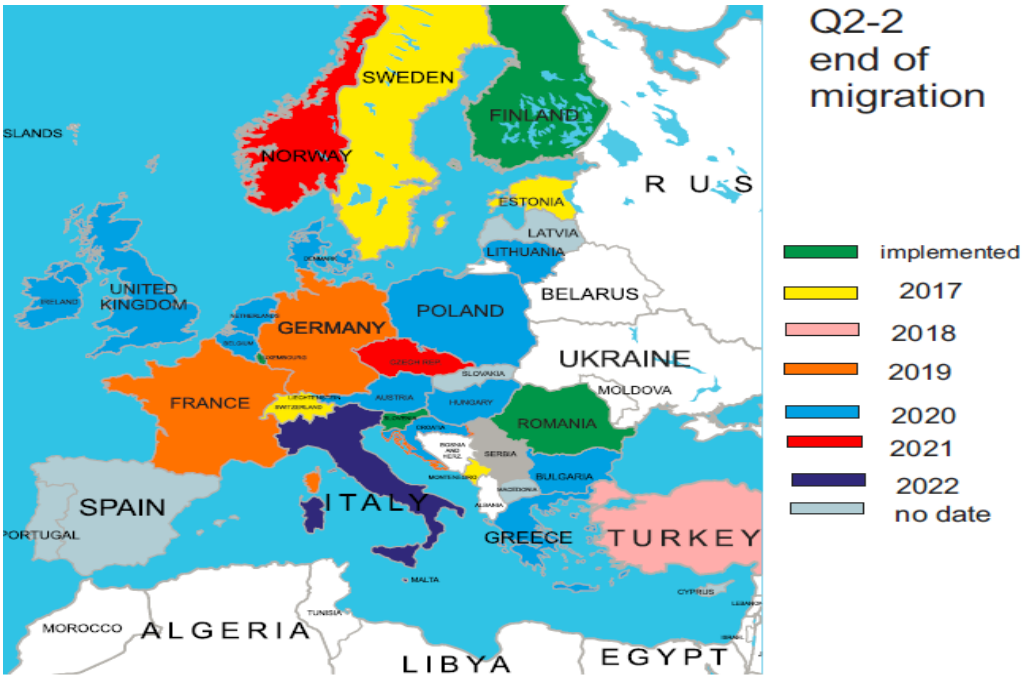


Figure 7: *Plans for migration*

[Source: RSPG 2019]

RSPG second questionnaire result. Some non-EU countries also responded to the questionnaire besides EU member states.

The RSPG Report“ on proposed spectrum coordination approach for broadcasting in the case of a reallocation of the 700 MHz band” was, in 2013, already emphasizing that “the negotiation approach should preferably, similarly to the 800 MHz, be based on bilateral and multilateral coordination with coordination groups such as WEDDIP” and that RSPG should encourage the creation of new groups.

Several regional groups had a key role in carrying out the cross-border negotiations and agreeing a multilateral plan, which was subsequently taken on board in bilateral agreements:

•WEDDIP (West European Digital Dividend Implementation Platform)

•NEDDIF (North-East Digital Dividend Implementation Forum)

•SEDDIF (South-East Digital Dividend Implementation Forum)

•BSDDIF (Black Sea Digital Dividend Implementation Forum)

•Adriatic group some of these regional groups were including non-EU countries since it was necessary for adopting a regional new plan.

In many cases, it created a momentum in favour of making available the 700 MHz band for mobile in these non-EU countries in a timeline alleviating transition issues.

The CEPT recognised the importance of a harmonised frequency arrangement for MFCN and the need of common and minimal least restrictive technical conditions (LRTC) for MFCN in the band 694-790 MHz. The following principles have been considered to define the MFCN frequency arrangement:

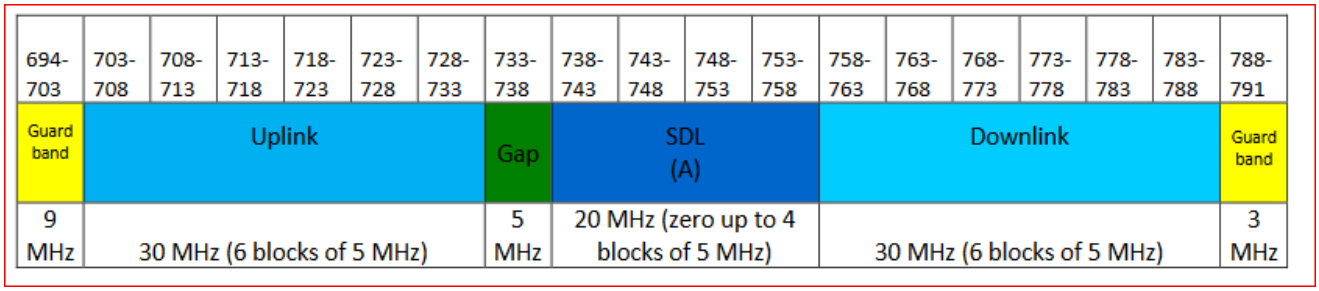
- Facilitation of roaming and border coordination to achieve global economies of scale for equipment;
- Use of a 5 MHz block approach which is in line with the foreseen mobile systems to be used in the 700 MHz;
- Protection of broadcasting below 694 MHz: an unwanted emission limit for terminal equipment of -42 dBm/8 MHz (assuming an MFCN channel of 10 MHz or less and a 9 MHz guard band) has been defined;
- Spectrum efficiency and high level of flexibility in order to adapt to national circumstances as well as to meet the changing need and demand for capacity in time and geography;
- No Digital Terrestrial Television (DTT) usage was assumed in the 694-790 MHz frequency band.

The frequency arrangement shall be as follows:

- The block sizes shall be in multiples of 5 MHz, which does not preclude smaller channel bandwidths within a block;
- A paired frequency arrangement (FDD);
- terminal station transmitter: 703-733 MHz;
- base station transmitter: 758-788 MHz;

- An unpaired frequency arrangement (SDL) on optional basis;
- SDL using 'zero or up to four' of the following frequency blocks: 738-743 MHz, 743-748 MHz, 748-753 MHz and 753-758 MHz.

The decision on the number of contiguous blocks would be taken at national level. This approach ensures flexibility for combination with other options identified by CEPT.



The CEPT regulation for the flexible harmonised use of the 700 MHz band for MFCN and other applications (PPDR, M2M, PMSE) have been approved. At CEPT, there are currently ongoing examinations of the possibilities of using MFCN bands – among them the 700 MHz band – for 5G purposes.

The Ministry (MIE) must define what national specificities are necessary to use in order to achieve its strategic goals in the established frequency allocation. The Authority (AKEP) should shape the use of the 700 MHz band accordingly and launch (MFCN) frequency coordination consultations with neighbouring countries. Main questions:

- Will 2x30 MHz or less be used for MFCN purpose?
- Should SDL used by mobile operators?
- Should we create 2x5 MHz, 2x3 MHz blocks for BBPPDR purpose?

11. FUTURE TRENDS (SPECTRUM)

The 700 MHz frequency band consists of radio spectrum in the range 694-790 MHz. It is part of the wider ultra-high frequency (UHF) band, currently used throughout Europe for terrestrial broadcasting. The UHF band comprises the range 470-790 MHz and is used for the transmission of various digital terrestrial television (DTT) channels and for wireless microphones in all EU Member States. Traditionally, this band has been exclusively allocated to broadcasting in Europe and Africa, as well as in large parts of the rest of the world. TV channels delivered to citizens via the UHF band are in standard definition (SD) and in high definition (HD) formats, and are received on TV sets at home through rooftop or room antennas.

The frequency band, 470-694 MHz, allocated to broadcasting is an essential element for the continued strength and diversity of terrestrial television services and their long-term global evolution.

Mobile operators using the 700 MHz band will be able to offer higher-speed and higher-quality broadband (i.e. without service interruption) to consumers and cover wider areas. It will enable Europe to move ahead and provide mobile broadband speeds beyond 100 Mb/s.

In order to support increased data traffic capacity and to enable the transmission bandwidths needed to support very high data rates, 5G will extend the range of frequencies used for mobile communication. This includes new spectrum below 6 GHz, as well as spectrum in higher frequency bands.

For providing ubiquitous coverage in next generation (5G) or pre-5G networks important role will be of LTE (4G) bands already harmonised below 1 GHz, including particularly the 700 MHz, and 800 MHz band, in order to enable nationwide and indoor 5G coverage.

The task within the 1.5 agenda item of WRC-23 to review the spectrum use and spectrum needs of existing services in the frequency band 470-960 MHz in Region 1 and consider possible regulatory actions in the frequency band 470-694 MHz in Region 1 on the basis of the review in accordance with Resolution 235 (WRC-15).

The ITU-R is invited to:

1. review the spectrum use and study the spectrum needs of existing services within the frequency band 470 - 960 MHz in Region 1, in particular the spectrum needs for broadcasting and mobile (excluding aeronautical)
2. carry out sharing and compatibility studies, as appropriate, in the frequency band 470 - 694 MHz between broadcasting and mobile (excluding aeronautical)
3. sharing and compatibility studies in order to provide relevant protection of systems of other existing services

The task of Working Party 6A is to conduct and complete the studies to review the spectrum use and study the spectrum needs of the broadcasting service, taking into account the use and the needs of the countries party to the GE06 Agreement, within the frequency band 470-960 MHz in Region 1 in accordance with resolves to invite ITU-R 1 of Resolution 235 (WRC-15) and report the results of these studies to TG 6/1 by 15 May 2021 at the latest.

The band 470-694 MHz is used by DTT in the CEPT and RCC countries, providing a large number of services to the public. The EU has decided to preserve this spectrum for broadcasting at least until 2030.

Taking into consideration that the ITU decision on the future use of the 470-694 MHz band will be in 2023, most of the European countries have extended their digital TV broadcasting radio licenses to 2030 (or 2032).

From Albania's point of view, the Authorities aim to do ensure that no longer than 2032 permits are granted. This helps to avoid the operators' claiming compensation in the event of a change in spectrum usage after 2032. If there is no further technological development, it can be expected that the number of national multiplexes will decrease further due to a DD3.

12. SPECTRUM-EFFICIENT TECHNOLOGIES

12.1 Available broadcast technologies

The usage of more efficient technologies is becoming increasingly important in addition to the use of scarce resources, spectrum. The spectrum requirement of the information to be transmitted should be

reduced while increasing the viewer's experience. In the field of digital broadcasting, more technologies and their improved versions are available. (DVB-T, ATSC, ISDB-T, DTMB)

DVB-T technology and its newer version DVB-T2 are typical on the European continent. There is general support for these technologies from manufacturers. The mass spread of the technology also means that the price of subscriber devices is acceptable to an average household.

12.2 Compression system

Several compression systems have been developed for the digitization and compression of audio-visual signals. In the case of DVB-T technologies, devices using the MPEG-2 compression system in the early stages and later the MPEG-4 appeared. The MPEG-4 encoding has already made it possible to transmit HD quality TV signals. Today's state-of-the-art compression method is HEVC, which has appeared in set top boxes and TVs at an affordable price.

13. ANALYSIS OF THE CURRENT SITUATION

The terrestrial television is a highly preferred platform by viewers in Albania (based on AMA report, which has prepared a terrestrial TV spectrum demand answer in preparation for ITU WRC23. The extended answer for ITU circular letter R00-SG06-CIR-0104!!MSW can be found in the annex.)

90 % of the population is covered by digital TV broadcasting. The target 99% of the population coverage is realistic, but it also requires signed frequency coordination agreements with neighbouring countries. There are still 65 analogue TV transmitters operating nationally, 38 regionally and 25 locally in the country, but these transmitters may soon be switched off later this year.

	470-694 MHz	**694-790 MHz (DD2)**	**790-862 MHz (DD1)**
Analogue broadcasting	used, ASO end of 2020	used, ASO end of 2020	clear
Digital broadcasting	used (final stage)	used	clear

In terms of spectrum usage, the goal is to reach the green area. The DD1's experience and best practice can be used partly. There was no intention to turn off the analogue TV network during the DD1 de-allocated. When de-allocated the DD2 band, it is not a prescribed goal to turn off the analogue TV transmitters. However, analogue transmitters are no longer protected, and the operation of analogue transmitters makes it impossible to use the optimal the 470-694 MHz band and it may reduce the number of available national multiplexes.

Based on the available spectrum the 7 national layers can be considered very high. The 7 national layers is also high in international comparison. "Report ITU-R BT.2302-0 (04/2014) Spectrum requirements for terrestrial television broadcasting in the UHF frequency band in Region 1 and the Islamic Republic of Iran" gave the general overview about the plan of the country in UHF band (470-862 MHz). Required number of multiplexes in the UHF band in the future 4-6 on average planned by countries. The planned number was not determined on the basis of national needs, but it is maximum which can be extracted from the available frequency set. This number was determined

even without DD1. The 4-6 value decreased to 4-5 after DD1. After the DD2, without any further frequency coordination, the value 4-5 decreases further. It has been recognized by several countries and has begun multi-country frequency coordination (see SEDDIF) to further maintain the number of available national multiplexes.

In the present situation, Albania operated 7 national multiplexes after DD1.The two digital networks of the Albanian Public Operator (RTSH) do not contain DD2 channels.

Allotment affected by DD2 channels is marked in yellow in the table. It can be seen that with the loss of the DD2 channels, 4-5 national multiplexes can be formed in total. This is why it is important to speed up operational frequency coordination, even with additional ITU assistance.

Numri Rrjeteve	Allot. Shkodër	Allot. Kukës	Allot. Dibër	Allot. Lezhë	Allot. Tiranë	Allot. Elbasan	Allot. Fier	Allot. Berat	Allot. Korçë	Allot. Gjirokastër	Allot. Vlorë
MUX-3	34	50	55	33	41	42	35	32	51	44	46
MUX-4	59	40	30	46	53	48	28	36	55	29	57
MUX-5	45	42	25	29	59	49	22	54	57	50	43
MUX-6	22	36	54	-	57	46	29	24	21	48	51
MUX-7	51	52	60	-	39	40	45	47	27	35	53

The currently available TV channels and their resolution are summarized in the table below. This capacity requirement must be met by reducing the available spectrum (see DD2).

Available national FTA TV programme services	*Number*	23 (10 HD + 13 SD)
Available local and regional FTA TV programme services	*Number*	21 (3 HD + 18 SD)
Available national pay-TV programme services	*Number*	79 (25 HD + 54 SD)

The national level the strong multiplex model used. There are two DTT networks for public operators and 5 five commercial DTT networks. One of the public operator networks is used to support programs of local and regional operators. There are no regional DTT networks. Regional operators support their programs on national DTT networks. There is one local digital network in one allotment. There would be a demand for local broadcasting, but their frequency planning is not feasible until prepared and accepted the new national plans.

Technical solution to maintain capacity with decreasing bandwidth:

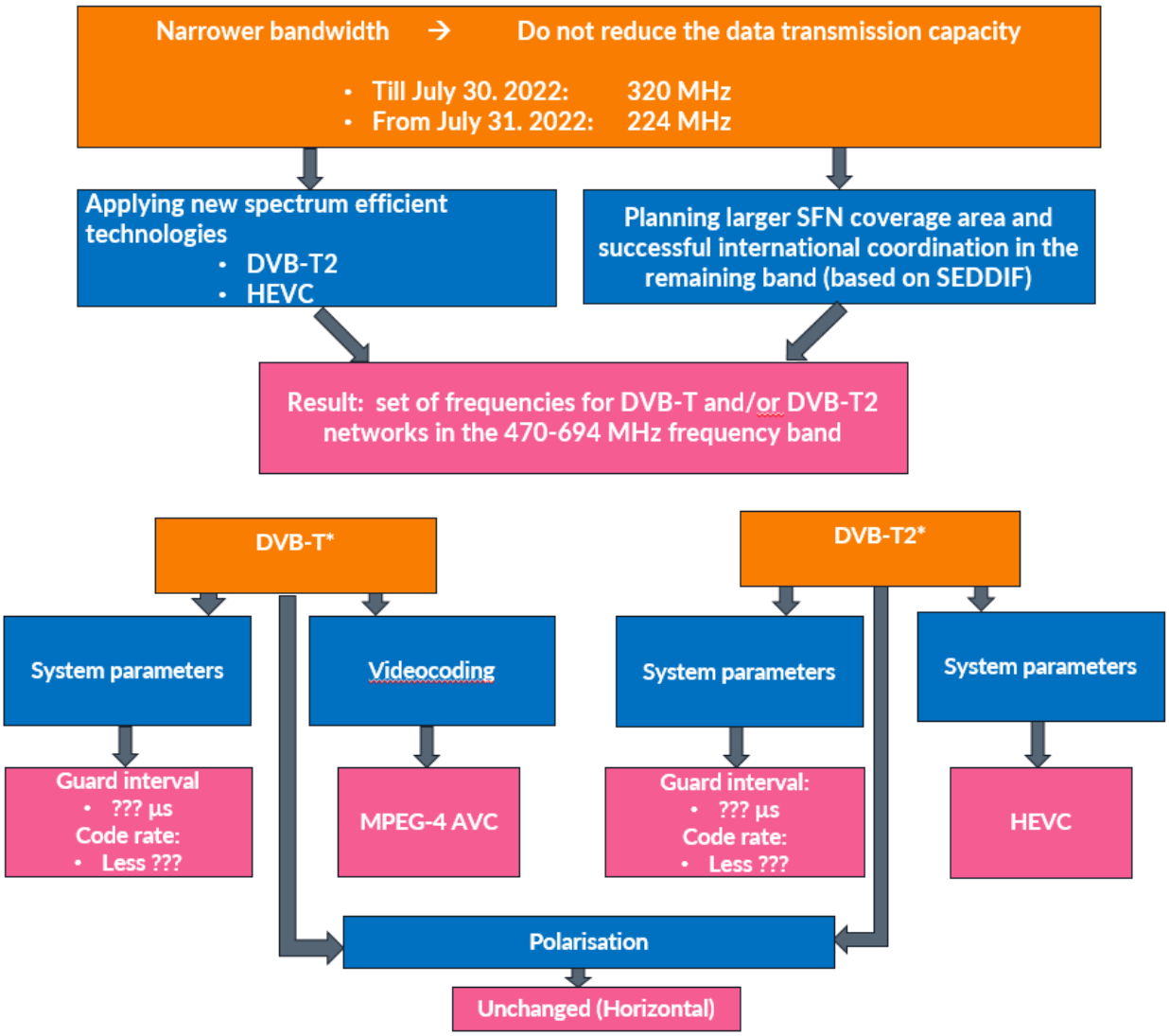


Figure 8: *Technical solutions*

[Source: own]

Albania has introduced the advanced broadcasting technology (DVB-T2). Multiplex capacity can be increased by 30% if HEVC encoding is used instead of MPEG 4. If the DVB-T2 television set or set top boxes which are currently operating in households capable of handling HEVC, consideration should be given to switching to HEVC. If the television set or set top boxes are not able to handle the HEVC and are in large quantities in households, in this situation this changing would be very costly for households or the state.

Let's look at an example of the cost of switching from MPEG4 to HEVC. (Cells marked in yellow are free to parameterize in the table.) We assumed 1.138 million TV sets in Albania. TV sets are replaced by households on average every 8 years. Of course, not everyone watches terrestrial TV at home, but the capability of the device is important. When replacing the device, it is possible to calculate only a given proportion of the cost, e.g. in case of 50% social needy, or only in case of pay-TV necessary to change FTA available MPEG4, or the level of device subsidy e.g. 50%. Cost are calculated with SAMSUNG UE43TU7172 set. The price of the devices decreases from year to

year, but not knowing the projected rate of inflation, the price of the device in the example remained unchanged every year. It can be seen that regulation is very important for the placing of devices on the market. If there is no forward-looking regulation, the cost of replacement of the device would be LEK 26 billion in the case of an example. If there is such a regulation, this amount can be eliminated during the average device replacement. It is also see how much the remaining device replacement cost is in the year of MPEG4-HEVC replacement. This is cost belongs to the receiver part.

		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Total TV set quantity	1 138 400	1 138 400	1 138 400	1 138 400	1 138 400	1 138 400	1 138 400	1 138 400	1 138 400	1 138 400	1 138 400	1 138 400	1 138 400	1 138 400
Average replacement time (year)	8													
Annual replacement quantity	142 300	142 300	142 300	142 300	142 300	142 300	142 300	142 300	142 300	142 300	142 300	142 300	142 300	142 300
HEVC capable quantity	0	0	0	142 300	284 600	426 900	569 200	711 500	853 800	996 100	1 138 400	1 138 400	1 138 400	1 138 400
Only HEVC can be on the market	-	0	0	1	2	3	4	5	6	7	8	8	8	8
Rate of change		0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5
Quantity to be replaced		569 200	569 200	498 050	426 900	355 750	284 600	213 450	142 300	71 150	0	0	0	0
HEVC TV price (LEK)	46 366	46 366	46 366	46 366	46 366	46 366	46 366	46 366	46 366	46 366	46 366	46 366	46 366	46 366
Total cost of change (LEK)		**26 391 527 200**	**26 391 527 200**	**23 092 586 300**	**19 793 645 400**	**16 494 704 500**	**13 195 763 600**	**9 896 822 700**	**6 597 881 800**	**3 298 940 900**	**0**	**0**	**0**	**0**

(This table available in Annex 2)

There is also a cost on the transmitter side due to the replacement of the encoders but these costs are negligible compared to the receiver side.

System parameters

The used system parameters on the national multiplexes give a big data rate and good reception at the viewers.

Modulation:	64 QAM
FFT mode:	32k
Code rate:	¾
Guard Interval:	1/16 (224 µs, 67 km)
Pilot Pattern:	PP4
Rotated Mode:	yes
Extended Mode:	yes
Total data rate:	31.2 Mbit/s

It can be refined on these parameters but does not bring a large increase in capacity of multiplex.

Low-power transmitters are operated in the country. This is not typical internationally, but due to Albania's topography, this could be a good solution. Larger SFN allotments have not been developed yet, which may bring on the significant results to solve the problem.

It is not advisable to analyse national multiplexes (layers) separately as described above. The use of common infrastructure is very important, including common sites, transmitters and multiplexes. Typically, one operator builds the transmitter networks and one operator aggregates the TV channels into the multiplexes. (The two operators may be the same.) This solution means smaller OPEX and CAPEX on national level.
This does not indirectly bring competition in this field, but in fact competitors are represented by other platforms, e.g. DTH, IPTV operators.
The infocommunications sector is moving from infrastructure-based competition to service-based competition. The construction and operation of the infrastructure represents a high proportion of the operator's cost. Operators want to reduce their costs by sharing their passive and / or active infrastructure, including the spectrum sharing. Multinational mobile operators are setting up their

tower companies in the interest of using each other's infrastructure in the future. The necessary legislation must be adopted in advance by the Ministry.

14. ACTION PLAN

14.1 Options for possible solutions

A two-ways approach is proposed to handle the current issue, aiming to aid the Albanian authorities. These two ways can provide solutions as stand-alone options but also can be applied together to reach the potentially best results. These two solutions are infrastructure sharing - between broadcasters, service providers inner country - , and possible allotment enlargement that requires coordination with neighbouring countries. With the loss of 700 MHz band most countries successfully applied these models in a parallel way. Additional gains can be achieved through modifying system parameters, but they cannot compensate the loss of bandwidth.

14.2 Infrastructure sharing

For such solution to be applicable the legal framework has to be clear to eliminate any competitive disadvantage that may occur, especially in the private sector. In addition, the validity of granted licences has to be taken into account as it may mean certain compensation needs towards the licence holder from the state. Sharing infrastructure can be done in different ways depending on whether the state has the aim to gain control over it, or leads providers to form agreements of sharing in their own level. Infrastructure sharing may require overlooking the used capacity rates of multiplexes, as it would mean different broadcaster putting their content into the same multiplex it has to be seen whether the current rate of free capacity in a multiplex allows this solution to be implemented.

Capacity can be further improved by using upgraded video coding techniques (HEVC) if necessary.

14.3 Allotment enlargement

The Decision of the European Parliament and the Council (Decision (EU) 2017/899) resulted in countries launching coordination groups such as WEDDIP, NEDDIF, SEDDIF in order to handle the loss of the 700 MHz band. One possible way of doing so is extension allotment sizes to preserve existing layers. In the case of Albania SEDDIF (South European Digital Dividend Implementation Forum) holds the most important role of the above mentioned groups, because it involved the neighbouring countries of Albania. In this group the following process was introduced to produce allotment and assignment plans that grants equitable access to the resources and helped in providing a clear frame to facilitate agreements between countries. The table shows the working method and workflow of the SEDDIF group.

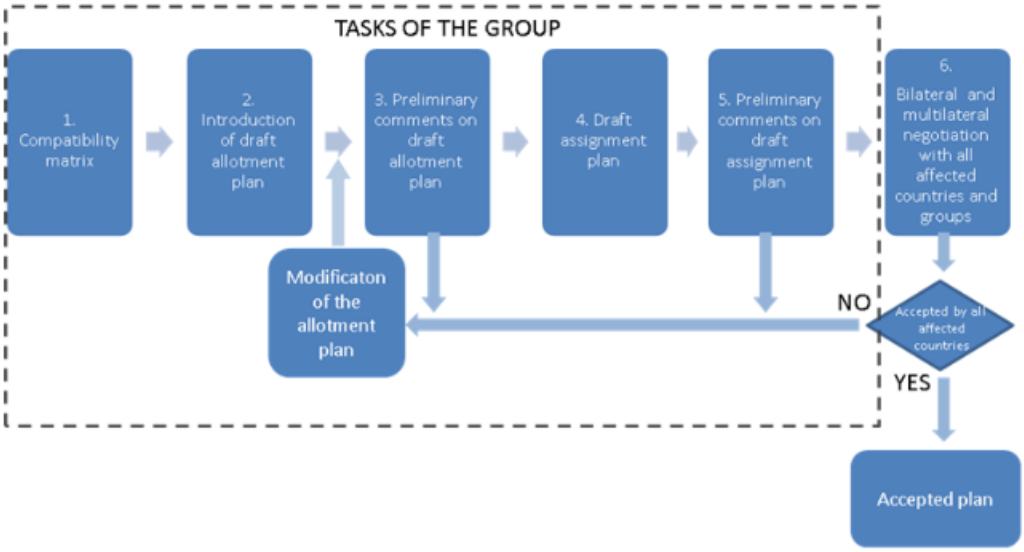


Figure 9: *Technical solutions*

[Source: NMHH]

This procedure requires frequency planning and coordination, which consists of multiple bilateral agreements. This process is still ahead of the Albanian authorities, which implies careful and detailed planning, and cannot be done without assessing the current allotment distribution in neighbouring countries. Best practise would be if the Albanian authorities would request the neighbouring countries to clarify their up to date allotment configurations. That being a clear base to start planning and frequency coordination, the method could be started with the aim of configuring the best enlargement plan that is harmonized with the neighbouring countries.

The main aspects and priority during in frequency coordination strategy during the coordination meeting:

1. National layers (multiplexes)
2. Regional layer(s) (multiplexes)
3. Local TV

14.4 Overview

Both of the above-mentioned methods are equally important and should be considered as such. Infrastructure sharing has the possibility of lowering operational expenditures, and proves to be a more eco-friendly way of operation, but it may be complicated to get to an agreement with the existing operators in the topic of infrastructure sharing as could be challenging to persuade them. While the allotment extention is rather a necessity to meet the needs of the desired number of layers in the narrowed UHF band for broadcasting. The potential gain of these methods are the possibility of keeping the desired number of layers, while they do not result in additional costs for the end-user. On the other hand a coordination process with neighbouring countries is inevitable. Using them together shall give the desired outcome, however it must be noted that the process may take long, and deliberate planning should reinforce the intention.

Steps to facilitate frequency coordination should begin immediately by the Albanian Authorities. Frequency coordination can take more than a year, so it may not be possible to complete frequency coordination with all neighbouring countries until the target date.

14.5 Administration

Audiovisual media and infocommunications tasks are performed in several organizations (MIE, AKEP, AMA). The design of the administration is based on each country's own internal decision, including the EU countries. In order for the defined tasks to be completed till deadline by several organizations, it requires that there be a day-to-day operative relationship between the involved organizations. In the event that this cannot be achieved, the common goal will not be achieved. On the other hand the various market players recognize that the administration is not uniform on this issue and they will use lobbying to prevent the common goals. In case the administration is not separated into several organizations, the achievement of the common goal may be faster and easier.

15. Task and deadlines of the action plan

15.1 Frequency coordination

The following article draws a possible action plan with estimated deadlines aiming to leave 700 MHz band on time: 30th of July 2022. The action plan contains steps that are built on one another, but the deadlines are somewhat flexible:

- Get allotment extension data and assignment data from neighbours. Practically, this should consist of up to date information of the allotments and the coordinated assignments of neighbouring countries. If it is not available, it is necessary to have measurement results from neighbours.(band clearance measurements) Possible deadline: November of 2020

- Based on the received data start the planning process. Possible deadline: December of 2020

- Finish the planning process at latest 30th of July in 2021

- Start bilateral coordination based on the planning process results. Possible deadline: July of 2021

- Based on the outcome of the bilateral coordination the new allotment distribution should start, discussion with the providers over the switchover should come to finalization. Possible deadline: December of 2021

- All the switch over should be done by 30th of July 2022

In the build-up of the planning process a spectrum strategy and a technical overview is equally vital, speaking from the coordination process point of view the used propagation models must be carefully picked to produce the best result, and it could also be helpful to understand the processes and propagation models, that were used in neighbouring countries. Performing measurements on

boarders may accelerate the planning process and if the possibility is given, measurements can help refine a coordination plan.

In case of finishing the action plan on time proves to be out of reach, a plan B has to be figured out, either by pushing back the deadline or putting greater emphasis on infrastructure sharing.

15.2 Infrastructure sharing

An overview of the **regulation** in terms of that it contains restrictions on the use of this common infrastructure and how it can be eliminated after 1 March 2021.

1. Identify restrictions — at latest 31 October 2020
2. Preparation of a proposal for their elimination — at latest 30 November 2020
3. Public consultation of the proposals — at latest 31 December 2020
4. Processing of received comments and suggestions — at latest 31 January 2021
5. A final law put into force — at latest 28 February 2021

Establish an **incentive system** for use of common infrastructure.

1. Preparation of a proposal for incentive system (financial compensation and / or recalculation of the present permissions) — at latest 31 December 2020
2. Public consultation of the proposal — at latest 31 January 2021
3. Processing of received comments and suggestions — at latest 28 February 2021
4. Launch of the incentive system — at latest 1 March 2021

It is practical experience that operators need one year for replanning, reinstall their network elements.

15.3 Receiver side (optional)

(In case that a decision is made that additional capacity would be required for the future, for example, UHD transmissions, or in preparation for a further reduction the bandwidth in the UHF band after WRC23.)

1. *To regulate the distribution of TV set and set top boxes*
2. *Monitoring the proportion of HEVC-capable devices* — *(continuous from now)*
3. *From that date, only HEVC-capable devices can be sold*
4. *Subsidies the viewers to change their TV set or set top box*
5. *Day of switch off MPEG4*

Prepared by Péter Vári Phd. on September 30, 2020

Annex 1

Radiocommunication Bureau (BR)

Circular letter
6/LCCE/104

27 February 2020

To Administrations of Member States of the ITU of Region 1, Radiocommunication Sector Members of Region 1 and the Islamic Republic of Iran

Subject: **Questionnaire on spectrum use and spectrum needs for terrestrial television broadcasting in the UHF frequency band in connection with WRC-23 agenda item 1.5**

References: **Administrative Circular CA/251**

Under the terms of the decision of CPM23-1, Working Party 6A is responsible for providing information on, *inter alia*, spectrum use and needs by the Broadcasting Service in the band 470-960 MHz to TG 6/1, as required for studies under WRC-23 agenda item 1.5.

Report ITU-R BT.2302 "Spectrum requirements for terrestrial television broadcasting in the UHF frequency band in Region 1 and the Islamic Republic of Iran" was approved by Study Group 6 in 2014 as part of the preparations for WRC-15. The table in Attachment 1 to Annex 1 of this Report contains the detailed responses received from administrations in 2014.

WP 6A proposes to revise this Report to assist with provision of information to TG 6/1 on the spectrum use and needs for the broadcasting service amongst administrations of Region 1 and the Islamic Republic of Iran.

You are invited to answer a questionnaire to update the information in Report ITU-R BT.2302. The questionnaire is available online at http://itu.int/go/wrc23-ai1-5-questionnaire. Alternatively, responses can be sent to brsgd@itu.int or rsg6@itu.int. An offline version of the questionnaire is available at the same web address. Please note that the response should come via the Designated Focal Point for your administration or organisation.

Please note that some questions correspond to questions in the 2012 survey – found in Circular letter 6/LCCE/78. The wording in this questionnaire has been modified to reduce ambiguities found in the first survey.

Sources of information that may be helpful in compiling your response are available at the following websites:

1. The WP 6A SharePoint site: https://extranet.itu.int/rsg-meetings/sg6/wp6a/Lists/DTTB%20Questionnaire/overview.aspx
2. The ITU-D "Status of the transition to Digital Terrestrial Television" database: https://www.itu.int/en/ITU-D/Spectrum-Broadcasting/DSO/Pages/default.aspx
3. ITU-R Handbook on Digital Terrestrial Television Broadcasting networks and systems implementation - Chapter 3 "Requirements for the implementation of digital terrestrial television broadcasting networks"
4. Report ITU-R BT.2302 "Spectrum requirements for terrestrial television broadcasting in the UHF frequency band in Region 1 and the Islamic Republic of Iran"

Answers are requested by **14 August 2020** to allow for processing the responses and their consideration by WP 6A in its next meeting in October 2020.

You are further asked to note that if any administration does not respond to the questionnaire by 14 August 2020, the Rapporteur Group (on WRC-23 AI 1.5) compiling the information for Working Party 6A will assume that the information received in response to the 2012 questionnaire is still valid, recognising that there is not full correspondence between the 2012 questions and those in the current questionnaire.

Additionally, you are reminded that you are welcome to submit any proposals for modifications to the rest of Report ITU-R BT.2302. Such proposals may be submitted directly to the next meeting of Working Party 6A in October 2020. The deadline for submission of proposals to the meeting of WP 6A is one week before the start of the meeting.

The BR remains at your disposal should you have any questions or require any assistance regarding this process. Please direct any questions to brsgd@itu.int or to rsg6@itu.int.

Please note that this questionnaire has been developed by ITU-R WP 6A. At the request of the Chairman of Working Party 6A, it is sent for consideration of the Administrations of Member States, Sector Members, as appropriate.

Mario Maniewicz
Director

Attachment: Spectrum needs and use questionnaire

ATTACHMENT

Questionnaire on spectrum use and spectrum needs for terrestrial television broadcasting in the UHF frequency band in Region 1 and the Islamic Republic of Iran in connection with Resolution 235 (WRC-15)

(To be attached to draft Circular Letter)

Deadline for response: 14 August 2020

This questionnaire can be completed online at http://itu.int/go/wrc23-ai1-5-questionnaire
Alternatively, responses can be sent to brsgd@itu.int or rsg6@itu.int

Name of the Administration:	**Audiovisual Media Authority**
Contact person:	**Elkeda Domi**
E-mail address:	**elkeda.domi@ama.gov.al**
Telephone number:	**+355672026323**

Name of the Sector Member	
Contact person:	
E-mail address:	
Telephone number:	
What best describes your organisation? Commercial broadcaster/Public service broadcaster/ Service provider(please describe)	
The geographical area over which you operate:	

Question number	Field	Data Type	Example answer	Response from Administration/Sector Member etc.	Corresponding field in Att. 1 to Annex 1 to Report ITU-R BT.2302 (for possible update)
1	What is the total proportion of the population that view programs using terrestrial television broadcasting in your country?[1]	*Number (Percentage)*	75%	80%	
1.a	How many analogue TV transmitter does operate in your nationwide network in UHF band?			65	
1.b	How many analogue TV transmitter does operate in your regional networks in UHF band?			38	
1.c	How many analogue TV transmitter does operate in your local networks in UHF band?			25	
2	When did or will DTTB[2] start in your country?	*Date (Year)*	1997	2016	
3	When did or will ASO[3] occur in your country?	*Date (Year)*	2012	2020	
4	What DTTB transmission technology is used in your country (multiple answers are possible)?	*DVB-T, DVB-T2, ISDB-T, DTMB, DTMB-A, ATSC, ATSC3.0*	DVB-T DVB-T2	DVB-T2	
5	Do you anticipate the introduction of a more advanced DTTB transmission technology in your country?	*Y/N/Not known*	Not known	Not known	
6	What percentage of population in your country is covered by DTTB networks?	*Number (Percentage)*	98.5%	90%	

[1] This should include all uses: Main TV set, Secondary TV set (Bedroom, Kitchen, etc.), including both analogue and digital reception.

[2] DTTB: Digital Terrestrial Television Broadcasting.

[3] ASO: Analogue Switch Off.

7	If you have current plans to change the percentage of population covered by DTTB networks in your country, what is your target coverage?	*Number (Percentage)*	98.7	99%	
8	What is the total number of operational or planned national DTTB multiplexes in the 470-960 MHz band in your country?	*Number*	8	7	
9	What is the total number of operational or planned national DTTB multiplexes in the 470-694 MHz band in your country?	*Number*	6	2	
10	What is the maximum number of operational or planned local or regional DTTB multiplexes in the 470-960 MHz band in one geographical coverage area in your country?[4]	*Number*	3	1	
11	What is the maximum number of operational or planned local or regional DTTB multiplexes in the 470-694 MHz band in one geographical coverage area in your country?[4]	*Number*	3	1	
12	What is the current frequency range that you use for the operation of DTTB in the 470-960 MHz band in your country?	*Frequency range (xyz MHz - x'y'z' MHz)*	470-758 MHz	470-790 MHz	
13	How many national *SD and HD* free to air TV programme services[5] are broadcast on DTTB in your country?[6]	*Number*	110	23 (10 HD + 13 SD)	
14	How many *SD and HD* local or regional free to air TV programme services are broadcast on DTTB in your country?[6]	*Number*	55	21 (3 HD + 18 SD)	

[4] For example, if Area A has 3 local multiplexes, and Area B has 2, respond with 3.

[5] A multiplex in a TV channel provides the transmission capacity for several TV programme services at the same time (e.g. 6 to 8 TV programme services). An analogue channel provides a single TV programme service.

[6] Please provide this supplementary data, considering the wide range of possible configurations of DTTB networks, which will naturally have different capacity bitrate.

15	How many *SD and HD* national pay-TV programme services are broadcast on DTTB in your country?[6]	*Number*	27	79 (25 HD + 54 SD)	
16	Do you anticipate the introduction of more programmes on DTTB in your country in the future?	*Y/N/Not known*	Y	Y	
17	Do you anticipate the introduction of enhanced services (e.g. HDTV, UHDTV, HDR, others) on DTTB in your country in the future?	*Y/N/Not known*	Y	Y	
18	Do you foresee the need to allow for additional reception modes (e.g. portable, mobile) on terrestrial broadcasting in your country in the future?	*Y/N/Not known*	N	*Not known*	
19	Do you use or plan to use interactive broadcast broadband (IBB)[7] systems on your DTTB platform?	*Y/N/Not known*	Y	*Not known*	
20	What is the total number of operational or planned DTTB transmitters in the band 470-694 MHz?[8]	*Number*	5561	228	
21	What is the total number of operational or planned DTTB transmitters in the band above 694 MHz?[7]	*Number*	50	66	
22	What other services (including applications in these services) are in operation in the 470-694 MHz band in your country, and what is their status of allocation?	*Services names (PMSE, Radio-Astronomy, Aeronautical Radio Navigation service, etc.)* *Primary/Secondary/ Other*	PMSE / Secondary Radio-Astronomy / Primary		

[7] Definition of IBB (from https://www.itu.int/en/irg/ibb/Pages/default.aspx): "An IBB system is based on the combination of the technologies of both broadband and various broadcasting including over-the-air and cable. Various multiple devices are used for effective presentation of content and user interactivity. Wide range of services are enabled by the IBB system."

[8] This refers to the transmitters for every multiplex on every transmitter site as well as redundant or reserve transmitters.

23	What is the total amount of spectrum needed in the UHF range in your country for broadcasting service taking into account the need for quality of service and answers to Questions above (in particular Questions 16, 17, 18, 19)?[7]	*Total Number of MHz required*	224 MHz	320 MHz	
24	What is/are the frequency range(s) that you consider necessary to accommodate the needs of the broadcasting service within the band 470-960 MHz in your country?[9]	*Frequency range(s) (xyz MHz - x'y'z' MHz)*	470-694 MHz	470-790 MHz	
25	Date of response to the questionnaire	*Date (Year/Month)*	2020/02	2020/08	
26	Modell of national DTTB? (weak, strong, mixed)			Strong There are 2 (two) DTT networks for public operators and 5 (five) commercial digital networks. One of the public operator networks is used to support programs of local and regional operators	
27	Modell of regional DTTB? (weak, strong, mixed)			There are no regional digital network in Albania. Regional operators support their programs on national digital networks.	
28	Modell of local DTTB? (weak, strong, mixed)			There is one local digital network in one allotment. We have requests from local operators to build local digital networks but due to the lack of frequency channels we cannot meet their requirements.	
26	Modell of national ATTB? (Does public or private TV content provider operate the TV transmitter also? (Yes, no or other.)			yes	

[9] Using any current or future broadcasting technology.

27	Modell of regional ATTB? (Does regional TV content provider operate the TV transmitter also? (Yes, no or other.)			yes	
28	Modell of local ATTB? (Does local TV content provider operate the TV transmitter also? (Yes, no or other.)			yes	

Any additional comments relevant to the answers you have given above (optional)

Annex 2

		2020	2021	2022	2023
Total TV set quantity	1 138 400	1 138 400	1 138 400	1 138 400	1 138 400
Average replacement time (year)	8				
Annual replacement quantity	142 300	142 300	142 300	142 300	142 300
HEVC capable quantity	0	0	0	142 300	284 600
Only HEVC can be on the market	-	0	0	1	2
Rate of change		0,5	0,5	0,5	0,5
Quantity to be replaced		569 200	569 200	498 050	426 900
HEVC TV price (LEK)	46 366	46 366	46 366	46 366	46 366
Total cost of change (LEK)		**26 391 527 200**	**26 391 527 200**	**23 092 586 300**	**19 793 645 400**

	2024	2025	2026	2027	2028
Total TV set quantity	1 138 400	1 138 400	1 138 400	1 138 400	1 138 400
Average replacement time (year)					
Annual replacement quantity	142 300	142 300	142 300	142 300	142 300
HEVC capable quantity	426 900	569 200	711 500	853 800	996 100
Only HEVC can be on the market	3	4	5	6	7
Rate of change	0,5	0,5	0,5	0,5	0,5
Quantity to be replaced	355 750	284 600	213 450	142 300	71 150
HEVC TV price (LEK)	46 366	46 366	46 366	46 366	46 366
Total cost of change (LEK)	**16 494 704 500**	**13 195 763 600**	**9 896 822 700**	**6 597 881 800**	**3 298 940 900**

	2028	2029	2030	2031	2032
Total TV set quantity	1 138 400	1 138 400	1 138 400	1 138 400	1 138 400
Average replacement time (year)					
Annual replacement quantity	142 300	142 300	142 300	142 300	142 300
HEVC capable quantity	996 100	1 138 400	1 138 400	1 138 400	1 138 400
Only HEVC can be on the market	7	8	8	8	8
Rate of change	0,5	0,5	0,5	0,5	0,5
Quantity to be replaced	71 150	0	0	0	0
HEVC TV price (LEK)	46 366	46 366	46 366	46 366	46 366
Total cost of change (LEK)	**3 298 940 900**	**0**	**0**	**0**	**0**