Nemzeti Média- és Hírközlési Hatóság

NATIONAL ROADMAP

FOR THE UTILISATION OF THE VHF III. (174–230 MHZ) AND THE UHF (470–790 MHZ) FREQUENCY BANDS

THE FUTURE OF
DIGITAL BROADCASTING
AND MOBILE BROADBAND
FREQUENCY USE OPTIONS

Public Hearing

20 June 2017

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1. Introduction

With the development of the digital economy, there is **increased need for frequency spectrum available for broadband technologies.** Due to the **scarcity of frequencies** technically suitable for broadband mobile service, frequency bands available for network development **may only be provided by releasing frequency bands assigned to and used by other services.**

The **first step** of releasing bands for mobile purposes was when the[1] 790–862 MHz frequency band (hereinafter: **800 MHz** frequency band, also known as Digital Dividend 1 (DD1)) from the part of the UHF band used for **television broadcasting** was released to terrestrial systems[2] capable of providing other wireless broadband electronic communications services, i.e. use for mobile services.

The **next band to be released** for the purpose of developing the digital economic infrastructure is the upper, 694–790 MHz range of the band adjacent to the 800 MHz frequency band and currently used for terrestrial digital television broadcasting (hereinafter: **700 MHz frequency band**) on a primary basis, also known as Digital Dividend 2 (DD2). The 700 MHz frequency band is valuable in terms of developing broadband mobile services because its physical characteristics allow for a cost-effective service coverage for large, scarcely populated areas using Mobile/Fixed Communication Networks (MFCN[3]).

The 5G **next generation mobile technology** opens up new perspectives for digital economic and business models.

The key technical parameters and components of 5G technology are already in the development and testing phase. 5G **allows for high-speed, highly reliable wireless broadband data transmission[4]**. Standardisation is in progress[5], the international organisations of frequency management (ITU[6], CEPT[7], European Commission, RSPG[8], RSC[9]) are currently working on the regulatory framework, and the National Media and Infocommunications Authority (hereinafter: NMHH) is also actively involved in the process. Although some of the processes of the change above have already begun, additional frequency bands must be also involved for the purpose of implementing 5G. RSPG has identified three

[1] UHF IV band: 470–582 MHz, UHF V band: 582–862 MHz

[2] MFCN: Mobile/Fixed Communication Network,

[3] With regards to the convergence of the fixed and mobile wireless communication services, the CEPT regulation introduced the term umbrella term MFCN (Mobile/Fixed Communication Networks), which includes the IMT (International Mobile Telecommunication) networks as well as other communication networks that belong to the mobile and fixed service.

[4] 5G technology offers data transfer connectivity well above 10 Gbps, less than 5 ms of latency, comprehensive utilisation of available wireless resources (WiFi, 4G) and simultaneous management of millions of connected devices.

[5] 5G-PPP, 5G vision, https://5g-ppp.eu/roadmaps/

[6] International Telecommunication Union

[7] Conférence européenne des Administrations des postes et des télécommunications – European Conference of Postal and Telecommunication Administration

[8] RSPG: Radio Spectrum Policy Group – Pursuant to 2002/622/EC Commission Decision of 26 July 2002 establishing a Radio Spectrum Policy Group (RSPG), the RSPG acts as an advisor in European strategic issues on radio spectrum.

[9] RSC: Radio Spectrum Committee – Decision No 676/2002/EC of the European Parliament and of the Council of 7 March 2002 on a regulatory framework for radio spectrum policy in the European Community (Radio Spectrum Decision) established the Radio Spectrum Committee (RSC) to act in technical regulatory issues of radiocommunication in Europe.

frequency bands that can soon (before the 2019 World Radiocommunication Conference) help in 5G implementation: 700 MHz, 3400–3800 MHz and 26 GHz[10].

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.**

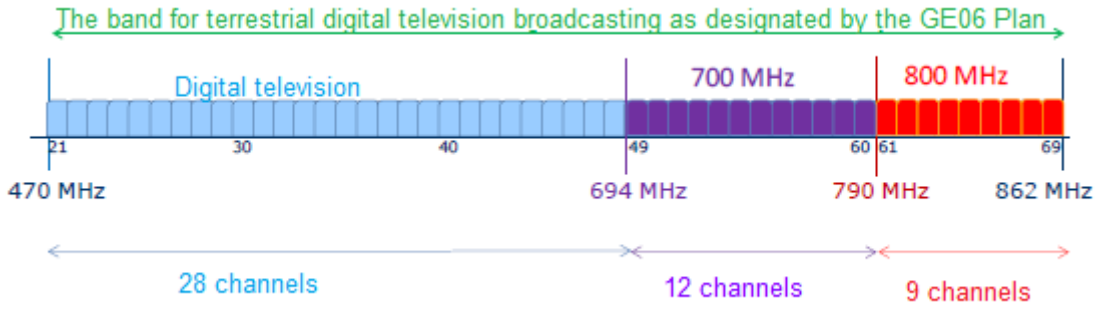

Figure 1: The UHF IV and V bands

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.** NMHH has already started international coordination on the level of multilateral coordination meetings and fora. Based on the experience learned from the replanning of the 800 MHz band, it can be established that the launch of the new service **requires European coordination of certain steps (band clearing, tendering)** considering that a single country may hinder the efforts not only of its own neighbours but almost all European countries. The regulatory environment for the future of the UHF band must be established with due consideration to EU obligations, in such a way that when creating the strategy for the wireless broadband utilisation of the 700 MHz frequency band, due consideration must be given to all mobile bands and other related issues, especially the broadband needs of PPDR radio applications[11].

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 (hereinafter: Decision) regulates Member State activities (with deadlines and a number of member state obligations) not only for the 700 MHz but it also provides for the use of the 470–694 MHz frequency range of the UHF band below 700 MHz. 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 frequency using industries (e.g. media, emergency organisations, healthcare, transportation). It is extremely important that the regulation equally meets market, government and social expectations.

[10] 26 GHz frequency band: 24.25–27.5 GHz frequency band

[11] PPDR radio applications: Public Protection and Disaster Relief radio application

The Decision requires a national plan and schedule (National Roadmap) to be prepared and coordinated with stakeholders to carry out membership tasks pertaining to the release of the 700 MHz frequency band. The purpose of this document is to consult the National Roadmap, and its annex lists the detailed steps of fulfilling the obligations outlined in the Decision with the deadlines.

2. Issues relevant to terrestrial digital television broadcasting

2.1 National network

Releasing the 700 MHz frequency band will have a significant impact on currently operating terrestrial digital television networks.

With regards to national terrestrial digital television broadcasting, it is a fact that the administrative concluded between Antenna Hungária Zrt. and NMHH on operating five digital television broadcasting networks expires on 5 September 2020.

Pursuant to the provisions of Act LXXXIV of 2007 on the Rules of Broadcasting and Digital Switchover (hereinafter: Digital Switchover Act), the national digital television broadcasting network and free-to-air broadcasting station operating licence (which also includes the frequency rights of use) may be obtained by way of a tender.

The expiration date of the administrative contract of Antenna Hungária Zrt. has a major influence on the timing of the new tender for the period after the contract expires. In order to ensure that the service is uninterrupted, the national tender for the operation of the digital network must be timed to ensure that the winning applicant has enough time to prepare for the service.

The winning applicant of the tender for the national digital television broadcasting network for the frequency band 470–694 MHz and the free-to-air broadcasting station operating licence needs at least one year of preparation before launching the service. Therefore, the winner of the tender must be published by 5 September 2019 at the latest.

Please explain your opinion regarding the statement above.

For the purpose of optimal use of the reduced spectrum for national terrestrial digital television broadcasting, left after band clearance, we need a solution that results in no intervention, and thus no financial strain, for those using the television service for free, whereas in case of subscription-based services it will be possible to use the capacity increase due to the technological upgrade in a flexible manner.

2.1.1 Technical implementation

Technology selection in the case of paid service

NMHH plans no technological upgrade for residents watching free programs, i.e. the currently used DVB-T technology will remain in use to transmit currently free programs.

While keeping the operation of the free platform unchanged, the technological upgrade will be available on the multiplexes transmitting subscription-based commercial programs.

For the current paid commercial programs, the technological upgrade would result in two or three multiplexes based on new technology. With two new multiplexes, the program offering would remain similar to the current one. If the frequency coordination allowed for the commissioning of three multiplexes based on new technologies, the program offering could be extended or higher quality could be provided by broadcasting HD and/or UHD programs.

Considering that the technological upgrade would require equipment replacement on both the transmitter and receiver ends or the deployment of additional receiving devices (set top box), the broadcasting provider would inevitably incur the costs of the technological change and it is not impossible that subscribers would be charged for the costs of the receiving equipment.

The switchover will not create any expense for viewers of free public service programs, nor will the state incur any such costs.

NMHH considers viewer interest as the top priority in the tendering procedure for the utilisation of the 470–694 frequency band, which in this particular case means access to public service content in the same format and under the same terms and conditions. Due to the possibility offered by the technological upgrade, the winning applicant can make its own business decision to develop and deploy its terrestrial broadcasting network.

Please explain your opinion regarding the statement above.

Utilisation of the 470–694 MHz frequency range (the sub-band below 700 MHz)	
The band must be continued to be provided for broadcasting and PMSE[12].	up to 2032 at least
Regulatory tasks • preparation of the draft legislative amendment (Act level legislation legislation on the terms of use past 2020, stipulation of technical requirements), • appropriate amendment of NMHH decrees	30 June 2018
Proceeding in and closing the national and local multiplex as per section 2.2 tenders	September 2019

[12] PMSE: Programme Making and Special Events

2.2 Local television broadcasting

The reduced spectrum remaining after band clearance also requires the situation to be managed with regards to local terrestrial digital television broadcasting.

Out of the 38 broadcasting stations operated by 37 local television stations, 14 are directly affected in the 700 MHz to be cleared, whereas the other broadcasting stations may be affected due to the planned band reshuffling and frequency coordination.

The uninterrupted operation of the 37 local television stations is guaranteed in terms of media law and infocommunications up until 5 September 2020 by Article 35 of Act CLXVIII of 2016 of the Hungarian Parliament amending Article 38 (1) of Act LXXXIV of 2007 on the Rules of Broadcasting and Digital Switchover (hereinafter: Digital Switchover Act).

Due to the need for uniform frequency management of the spectrum remaining after the clearance of the 700 MHz frequency band on 5 September 2020, the broadcasting station operating tender for audiovisual media services broadcast via local coverage broadcasting are practical and advisable to run parallel with the operating tender of the national terrestrial digital television broadcasting network.

Please explain your opinion regarding the statement above.

Next step for local television broadcasting	
Market demand survey	31 December 2017

2.3 Long-term future of the 470–694 MHz frequency band

In certain countries, IMT[13] may also be deployed in the 470–694 MHz range based on the decisions adopted at the World Radiocommunication Conference, 2015 (WRC-15). However, the European countries categorically rejected the idea to further decrease the 470–694 MHz frequency band for the benefit of mobile services. Therefore, they did not support the allocation of the 470–694 MHz frequency band (the UHF band remaining for broadcasting in the long run) or part of it to the mobile service, as they wish to use it for broadcasting.

Considering the release of the 470–694 MHz band for the purpose of IMT was not added to the WRC-19 agenda (its draft was decided at WRC-15). With that, the decision was postponed until the 2023 conference (WRC-23) 6 years later. Therefore, the frequency band will be reviewed and, based on the results, potentially allocated for IMT purposes only in the next WRC study period between 2019 and 2023.

Article 4 of the Decision requires member states to ensure at least until 2030 that the frequency band below the 700 MHz frequency range, i.e. the 470–694 MHz frequency band, allocated to broadcasting remains available for terrestrial broadcasting services, including the operation of wireless audio frequency PMSE devices. All this must be implemented with due consideration to technology neutrality.

Pursuant to the provisions of the Digital Switchover Act, the licences for the operation of the national digital radio and television broadcasting network and the broadcasting station may be obtained by way of a tender. The operation licence also includes rights of frequency use. The operation licence can be obtained for a period of 12 years.

Based on the information introduced above, protection for Hungarian broadcasting (including PMSE applications) must be provided until 2032 taking into consideration that as a result of a tender procedure the rights of use are obtained for 12 years according to the to the regulation in force.

Please explain your opinion regarding the statement above.

[13] IMT: International Mobile Telecommunications

2.4 International coordination

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.[14]

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 Hungary determines coordination principles together with the other countries concerned. Hungary is carrying out coordination activity in various regional and multilateral frequency coordination working groups.

Hungary joined the North European Digital Dividend Implementation Forum (NEDDIF) when it was founded in 2010.

The Austrian-Czech-Hungarian-Slovakian coordination group was formed in 2015 with the purpose to create a solution that benefits all participating countries in their four-country border zone.

The South European Digital Dividend Implementation Forum (SEDDIF) was founded in 2015 at Hungary's initiative. The purpose of SEDDIF is to facilitate coordination among the Member States regarding the replanning, coordination and implementation of the 470–694 MHz frequency band broadcasting networks. The working group is led by Hungary. Member states are: Austria, Bosnia-Herzegovina, Bulgaria, Croatia, Hungary, Macedonia, Montenegro, Greece, Serbia, Slovenia and Turkey. Observer country: Ukraine. Observer organisation: ITU.

Pursuant to the Decision, the Member States shall conclude all necessary frequency coordination agreements within the European Union by 31 December 2017 for the purpose of enabling the use of the 700 MHz frequency band for MFCN. This deadline can be realistically met only if

- all EU Member States cooperate;
- non-EU member states also participate in the negotiations;
- we share our plans with the neighbouring countries as soon as possible;
- we know the plans of the neighbouring Member States and
- we manage to find a compromise solution even if, considering the principle of equitable access, it is not the most beneficial one for all Member States.

RSPG deals with the European strategic issues of the radio spectrum in an advisory role. The topics in the RSPG work programe are processed by working groups headed by rapporteurs. The longest standing working group is the good offices working group focusing on crossborder frequency coordination issues. Proactive work related to the use of the 700 MHz frequency band already began in 2016 within the good offices working group. The objective of the working group is to review the situation and present the plans of the Member States to prevent the domino effect (any delay by any

[14] Austria, Czech Republic, Slovakia, Poland, Ukraine, Romania, Serbia, Croatia, Bosnia-Herzegovina, Slovenia

state affects not only its neighbouring states but also the neighbouring states of those), and relying on the power of publicity, encourage Member States to fulfil their implementation obligations. The working group has worked out a questionnaire as a foundation for its future efforts. The questionnaire had to be answered by 20 December 2016 in the first round, then by 31 May 2017 in the second round, where any changes could be communicated. The 28 Member States were also joined by some non-EU member states (Turkey, Macedonia, Switzerland, Norway, Montenegro and Serbia) and returned the questionnaire as this cooperation goes beyond the borders of the EU. Representing Hungary, NMHH is actively involved in this project.

The success of the coordination negotiations largely depends on how big a capacity need the neighbouring country has for terrestrial broadcasting and by when it plans to deploy MFCN in the 700 MHz frequency band, because results may only be achieved with mutual compromises.

In order to minimise the domino effect and with due consideration to the obligation to cooperate, the Hungarian plans for the introduction of MFCN, which also comply with the minimum technical harmonisation conditions and state that broadcasting will stop on 5 September 2020 in the 700 MHz frequency band, will be specified in NMHH Decree 7/2015 (XI.13.) on the national frequency allocation and the rules of using frequency bands. This amendment does not reflect the provisions that serve as the conceptual basis of the award procedure facilitating the utilisation for MFCN purposes.

In July 2017 NMHH plans to hold public consultation on the draft legislative amendment for legal harmonisation purposes. The law is planned to be published and enter into force in August 2017.

Frequency coordination agreements on the use of the frequency band below the 700 MHz frequency band	
concluding broadcasting agreements	31 December 2017

3. Issues relevant to terrestrial radio broadcasting

Analogue FM radios operate in the 87.5–108.0 MHz frequency band. The 2006 Regional Radiocommunication Conference allowed for the VHF III band (174–230 MHz) to be used to create T-DAB networks Europe-wide first existing simultaneously with FM radios and later replacing them. Development of radio broadcasting occurs in the long term in part because the frequency bands radio broadcasting uses, including digital radio broadcasting, represent smaller economic benefits to other services. Development of digital radio broadcasting requires suitable and affordable receivers, appealing content, high quality network and commitment from stakeholders of the communications and media market players for its implementation. DAB+ networks in Europe are developing at different speeds. Norway is the first country where after the DAB+ network is completed, the nationwide URH (FM) radio network is switched off one region after the other throughout 2017. Currently Hungarian and foreign DAB+ programs can be received in Hungary, in Budapest and its neighbourhood, as well as along the northern and western state borders.

Please explain your opinion *whether you think it is justified, for the purpose of a unified management of the spectrum available for digital radio broadcasting based on broadcasting infrastructural considerations, to proceed with at least one tender for a network providing radio media services with nationwide coverage in parallel with the tender for national terrestrial digital television broadcasting.*

National digital radio broadcasting	
Market demand servey, public consultation	by 31 December 2017

4. Broadband mobile use

In the years ahead, data traffic could rise exponentially; some envision a thousandfold increase by the 2020s. (This increase is expected to be slower in Hungary.) Satisfying the increased data transfer need is possible by increased spectral efficiency resulting from more advanced technologies. Technology developments in that direction include the following:

- small cell deployment,
- proliferation of LTE and LTE-A,
- the application of Carrier Aggregation, or
- specification, testing and launch of 5G technology.

Based on the current trends, other tools beside the increase of spectrum efficiency are also needed, primarily to allow for the use of new frequency ranges.

4.1 700 MHz frequency band

Similarly to the 800 MHz band, the 700 MHz frequency band is mainly beneficial to cover the scarcely populated rural areas because it allows for cost-effective wide area coverage using a large cell structure. In addition to its wave propagation characteristics, this frequency band proves also advantageous for coverage within a building when considering attenuation during penetration through buildings and walls. According to the approved channel arrangement plans, the 2x30 MHz spectrum with the spectrum available in the 800 MHz band will offer a good opportunity for the MFCN networks providing coverage in the rural areas.

New wireless data transfer technologies like LTE Advanced and more advanced aerial technologies like MIMO (Multiple input Multiple Output) offer spectrum-efficient solutions for planning and deployment of wireless networks. An added benefit of such technologies is that they are less sensitive to issues due to multipath propagation. Thanks to the new standards, the same bandwidth offers greater data traffic. Voice over LTE (VoLTE) technology offering HD voice, conference call and other web-based functionality are also available to users.

Governmental Decree no. 1062/2017 (II. 8.) on Hungary's Electronic Communications Policy (hereinafter: Infocommunications Policy) specifies governmental decisions related to radio spectrum policy. Pursuant to Section 1.28 of the Communications Policy, additional spectrum is needed to implement 5G services, and pursuant to Section 1.79 sufficient and suitable spectrum must be made available to satisfy continuously changing spectrum needs

Based on the Decision, the use of the 700 MHz frequency band must be available for terrestrial systems capable of providing wireless broadband electronic services (only in line with the harmonised technical conditions as specified by the Commission pursuant to Article 4 of Decision No. 676/2002/EC) by 30 June 2020. The technical harmonisation process was successfully concluded already in 2016 when Commission Implementing Decision (EU) 2016/687 of 28 April 2016 on the harmonisation of the 694–790 MHz frequency band for terrestrial systems capable of providing wireless broadband electronic communications services and for flexible national use in the Union (hereinafter: 700 MHz Commission Implementing Decision) was issued.

4.1.1 “Basic channelling arrangement”

Considering the ITU-R decision on “basic channel arrangement” and the CEPT tests, the 700 MHz Commission Implementing Decision specifies the following channeling arrangement for MFCN purposes. Each member state shall release 2x30 MHz (6 x 2x5 MHz block) spectrum for FDD-based[15] MFCN. The uplink is in the 703–733 MHz range while the downlink is in the 758–788 MHz frequency band. In comparison to the channeling arrangement of the 800 MHz band, it is a reversed arrangement as the uplink sub-band was assigned to the lower frequencies of the frequency band. In order to avoid reciprocal interference between the broadcasting band below 694 MHz and the MFCN uplink band, a 9 MHz guard band was identified in the 700 MHz Commission Implementing Decision.

694 – 703	703 – 708	708 – 713	713 – 718	718-723	723-728	728-733	733-738	738-743	743-748	748-753	753-758	758-763	763-768	768-773	773-778	778-783	783-788	788-791
guard band	Uplink						Duplex gap					Downlink						guard band
							Duplex gap	SDL										
9 MHz	30 MHz (6 x 5 MHz blocks)						5 MHz	20 MHz (max. 4 x 5 MHz blocks)				30 MHz (6 x 5 MHz blocks)						3 MHz

NMHH makes available the 2x30 MHz (6 x 2x5 MHz blocks) of the spectrum within the 700 MHz frequency band for FDD based MFCN within the frame of an award procedure to ensure that from 6 September 2020 frequency use for MFCN purposes becomes possible in most areas of the country.

Please explain your opinion regarding the statement above.

[15] FDD: Frequency Division Duplex

4.1.2 SDL

The 700 MHz Commission Implementing Decision specifies that within the 700 MHz frequency band, in the duplex gap a maximum of 20 MHz frequency sub-band may be used for Supplemental Downlink (SDL) as a national option in addition to the 2x30 MHz “basic frequencyarrangement”.

NMHH does not see the need to introduce the SDL in the 700 MHz frequency band.

> *NMHH is not planning to run a award procedure before 2020 to introduce the SDL in the duplex gap within the 700 MHz frequency band.*
>
> ***Please explain your opinion regarding the statement above.***

4.1.3 International coordination

The international coordination requirements for the introduction of the 700 MHz MFCN have been developed in the CEPT working groups. Coordination negotiations required to conclude the coordination agreements have begun with the neighbouring countries based on the relevant international regulatory documents. According to the “flexible harmonisation” recommended for the 700 MHz frequency band, the individual countries can decide about a number of applications on a national basis, which increases the importance of international coordination and further tasks are expected in that regard.

Based on the experience with the 800 MHz band, intensive coordination activity is expected to ensure compatibility among the various services. Hungary has successfully concluded an agreement with Ukraine for the coordination procedure between MFCN and the aeronautical radio navigation service regarding the 700 MHz frequency band. Considering that the digital switchover of terrestrial television broadcasting has not been completed in two countries (Ukraine and Bosnia-Herzegovina), it is still hard to predict what kind of 700 MHz strategy these countries will opt for.

Frequency coordination agreements on the use of the 700 MHz frequency band	
Initiating MFCN (including PPDR radio application) coordination agreements with the neighbouring countries	31 July 2017

4.2 Other MFCN opportunities beyond the 700 MHz frequency band

When creating the strategy for the wireless broadband utilisation of the 700 MHz frequency band, due consideration must be given to all mobile bands and other related issues, especially the broadband needs of PPDR radio applications.

In addition to the 700 MHz frequency band, future utilisation of the 1452–1492 MHz and 2300–2400 MHz bands, the sub-bands available for distribution in an award procedure of the 1800 MHz, 2100 MHz, 2600 MHz and the 3400–3800 MHz frequency bands as well as the frequency licences in the 2100 MHz (UMTS) and the 26 GHz bands to expire in late 2019 need to be taken into account to "compile" a frequency set to be offered for distribution in the award procedure.

4.3 MFCN schedule

Schedule for the award of frequencies for MFCN purposes	
Demand assessment, public consultation with market players	31 December 2017
Establishing regulatory conditions, applicable amendments to NMHH decrees (comprehensive legislative criteria reflecting the awarding concept)	31 March 2019
Proceeding in and closing the award procedure of the 700 MHz frequency band also involving other MFCN bands	31 December 2019
deployment by band	as soon as possible

5. PPDR radio application

The narrow-band (voice-based) communication of emergency services is supported worldwide by highly reliable, professional digital radiocommunication systems. However, the data transfer capacity of these TETRA or TETRAPOL-based systems (especially with image and video signals) is extremely limited.

Natural disasters, security tasks at events endangering public safety, at mass gatherings, etc. necessitate improved command, cooperation and intervention efficiency of the competent emergency response organisations by introducing the advanced and probably the most advanced technologies available on national as well as on international (regional and global) levels.

Currently, voice and, to a limited extent, data transfer capability for emergency response organisations in Hungary is provided by the Unified Digital Radio Communications System (hereinafter: EDR) based on TETRA technology. The use of the system is governed by Government Decree 346/2010 (XII. 28.) on networks for government use.

In harmony with the expectations of the European Union, the Government of Hungary issued Government Decree no. 1854/2016. (XII. 27.) on the improvement of the broadband capability of the uniform digital radio communication system, and called upon the Minister of Interior to prepare, after coordination with stakeholders, a feasibility study by 30 April 2017 on the improvement of EDR's broadband capability, and also invited the President of NMHH to participate in making the study.

BB-PPDR services[16] may be provided based on the following implementation models:

1. *Dedicated* model – a dedicated network infrastructure exclusively maintained for the purpose of BB-PPDR services;
2. *Commercial* model using the public network infrastructure – the State purchases the broadband mobile service from one or more commercial mobile network operators;
3. *Hybrid model* – a service based in part on a dedicated and in part on a commercial network infrastructure.

[16] BB-PPDR services: Broadband Public Protection and Disaster Relief services

Selecting the model also affects the state budget. (Reserving parts of the bands available for mobile (MFCN) for PPDR service purposes proportionately reduces revenues from awards.)

NMHH proposes to deploy a dedicated network by providing additional bandwidth for BB-PPDR services with 2x8 MHz in addition to the 2x30 MHz available for MFCN in the 700 MHz frequency band and some more in the 400 MHz band (especially in the 410–430 MHz range and/or in the 450 MHz band).

> *The Government will select the network model and NMHH is shall provide the required spectrum for the selected model.*

Decision on PPDR use in the 700 MHz band	
Assessment of governmental needs	31 July 2017

6. Other possible methods for use

In the UHF band PMSE devices, in particular radio microphones are expected to be used, which operate on the frequencies unused by television broadcasting networks in the specific PMSE frequency utilisation environment. The use of the 800 MHz frequency band of the UHF band by broadband wireless electronic communication systems has significantly reduced the number of frequencies available for PMSE. Designation to and use by MFCN of the 700 MHz frequency band further reduces the available options. Based on the currently effective frequency allocation and utilisation rules, the 800 MHz frequency band can already be used for PMSE purposes but obviously only to the extent that it does not cause any interference to the primary service.

Due to the reduced spectrum available for PMSE purposes, some frequencies assigned to other services will have to be released to PMSE applications during certain high-profile events (world championship, Euro cup, Olympics, Formula 1 race, festival, etc.). PMSE use and consequently the spectrum need is extremely high in urban areas and at locations frequently hosting events.

In addition to MFCN, the 700 MHz Commission Implementing Decision also specifies as a national option to provide dedicated frequency for wireless audio frequency PMSE applications in the 694–703 MHz and the 733–758 MHz frequency bands. Pursuant to the 700 MHz Commission Implementing Decision, wireless audio frequency PMSE applications include radio microphones, in-ear monitoring systems and audio links.

The 700 MHz Commission Implementing Decision points out that the PMSE (and DTT) systems operating below 694 MHz need to be protected against the systems operating above 694 MHz. In that regard, the Decision regulates power values (BEMs[17]) for the applications operating in the 700 MHz frequency band to protect, among others, applications below 694 MHz (including PMSE) as discussed above.

[17] Block Edge Mask

Pursuant to the 700 MHz Commission Implementing Decision, PMSE applications may operate in the 694–703 MHz and the 733–758 MHz frequency bands as a national option. In addition to PMSE applications, other applications have also been identified to use these bands (MFCN SDL, PPDR, IoT for certain parts of the frequency band) and share with PMSE applications in accordance with national band usage needs and the rules in compliance with EU requirements.

In accordance with the 700 MHz Commission Implementing Decision, PMSE applications can operate adjacent to MFCN; however, the needed protection for the latter would reduce the possibility for using the former.

Considering the use of MFCN and PPDR, we are not making the use of PMSE applications available in the 694–703 MHz and the 733-758 MHz frequency bands.

Please explain your opinion regarding the statement above.

Annex

Draft on the detailed steps of fulfilling the obligations outlined in the Decision

Deadlines relevant to the utilisation of the 470–694 MHz frequency range (the band below 700 MHz)	
Conclusion of frequency coordination agreements related to broadcasting	**31 December 2017**
Regulatory tasks • preparation of the draft legislative amendment (Act level legislation on the terms of use past 2020, recording of technical rules), • appropriate amendment of NMHH decrees	**30 June 2018**
Proceeding in and closing the national and local multiplex as per section 2.2 tenders	**September 2019**
The band must be continued to be provided for broadcasting and PMSE.	**at least up to 2032**

Deadlines related to local television broadcasting	
Market demand survey	**31 December 2017**
Proceeding in and closing the tenders relevant to local television broadcasting licences	**September 2019**

Deadlines relevant to the award of frequencies for MFCN purposes	
Initiating MFCN (including PPDR radio application) coordination agreements with the neighbouring countries	**31 July 2017**
Market demand servey, public consultation with market players	**31 December 2017**
Establishing regulatory conditions, applicable amendments to NMHH decrees (comprehensive legislative criteria reflecting the award concept)	**31 March 2019**
Proceeding in and closing the award procedure of the 700 MHz frequency band also involving other MFCN bands	**31 December 2019**
deployment by band	**as soon as possible**

Decision on PPDR use in the 700 MHz band	
Assessment of governmental needs	**expected by 31 July 2017**