National Media and Infocommunications Authority • Hungary

ITU Regional Seminar for CIS and Europe "Development of modern radiocommunication ecosystems"

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http://english.nmhh.hu/dokumentum/170996/rss_nmhh_2016_komm_fin.pdf

Introduction

HNG became member of the EU in 2004.

HNG implemented the EU's directives (including parts about electronics communications)

HNG actively participates in shaping and implementing the common radio-spectrum policy

Main pillars:

- Regulation
- Policies

Introduction

Strategy for 5-year periods

2011-15*, **2016-20**

Defining the strategic tasks of spectrum management

- National interests
- International commitments (ITU, CEPT, EU, etc.)

Changing domestic and international environment

(economic, social and user environment, habits of consuming media)

Economic, social policy, technological and regulatory trends

* The first strategy which handles civil and non-civil fields together.

Highlighted target areas

1. Satisfying increasing needs for **mobile broadband**
2. Satisfying needs for audiovisual **terrestrial broadcasting** and digitalization
3. Satisfying needs for narrow and **broadband PPDR** applications
4. Preserving the values of non-civil radiocommunications and satisfying their needs
5. **Shared or collective spectrum use**
6. Supporting the early adoption of modern, innovative technologies
7. Ensuring efficient, high quality spectrum management
8. Establishing a flexible and open system of institutions, serving communicational tasks at a high level
9. Satisfying spectrum needs in a constantly changing socio-economic environment
10. **Ensuring interference-free usage and carrying out measurements related to spectrum management**
11. Securing the legal frames of spectrum-management at a high level, the constant modernization of the regulation, the effective representation of national interests

Main challenges until 2020

1. Necessary to harmonize the spectrum **needs of mobile services** with the frequency **needs of terrestrial TV broadcasting**

   On the basis of EU regulations and the resolutions of WRC-15

   Considering domestic needs and interests

2. Necessary to urge the development of the national telecommunications infrastructure and innovation more powerful than before
   - promoting the development of infocommunication
   - keeping pace with developing wired technologies
   - complex sales models, multi-band, return of spectrum
   - Phasing out obsolete technologies
   - urging early adoption as needed
   - public databases (http://stir.nmhh.hu/?lang=2),
   - enhancing transparency
   - strengthening the facility of measurements (http://szelessav.net/)

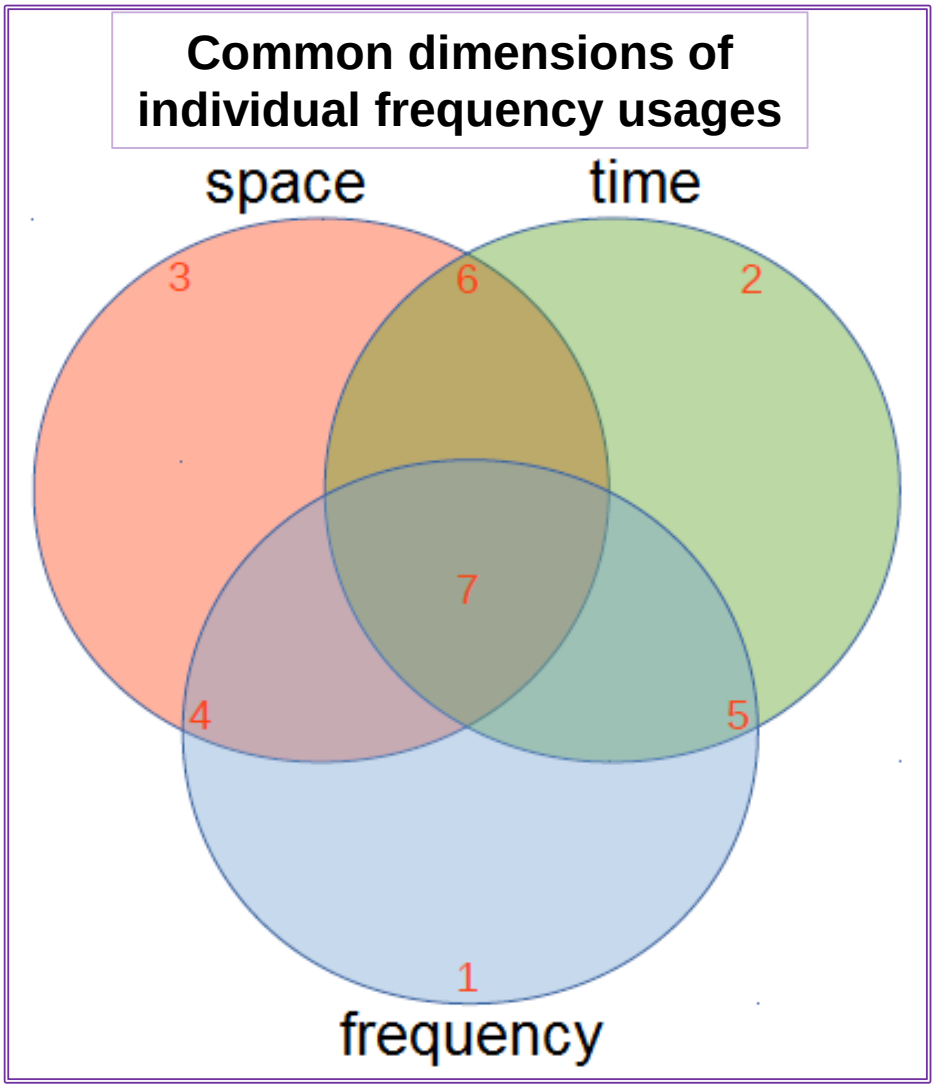
Main challenges until 2020

3. Providing a sufficient spectrum for PPDR applications
   - Ensuring the future for narrow band use (EDR, voice, at least another 10 years)
   - Getting prepared for the broadband needs harmonized way
   - Serving broadband, and broader band needs, sales of 700 MHz, the future of the regulation of 410-430 MHz and 450-470 MHz bands
4. Necessary to secure the main regulatory framework for modern spectrum management
5. Necessary to secure the possibility of using the spectrum free of harmful interference
   - Authority acts as a mediator
   - Strategy of measurements
6. **Necessary to secure the increasingly effective management related to the spectrum**
   - Shared use, LSA
   - Secondary trading
   - Fees (the value of the spectrum, non-civil bands)

Sales schedule

Radio spectrum - sales schedule	3400-3800 MHz	1452-1492 MHz	2300-2400 MHz	700 MHz	2100 MHz	2600 MHz	26 GHz
Mode of sales	Auction	Tender	Tender	Tender	Tender	Tender	Tender
Band segments to be sold	3410-3590 MHz 3600-3800 MHz	1452-1492 MHz band	?	703-733/758-788 MHz; and max 4X5MHz (738-758 MHz)	1965-1980/2155-2170 MHz or 1920-1980/2110-2170 MHz	2600-2615 MHz	24549-24605/25557-25613 MHz; 25249-25445/26257-25453 MHz
Possible ways of utilizing the band (applications)	MFCN (3410-3590 MHz TDD, 3600-3800 MHz TDD)	MFCN - SDL	LSA MFCN/PMSE	MFCN + ?SDL?	MFCN	MFCN	digital point-point, point-multi point
Date of liberation				September 5, 2020			April 30, 2019
Date of opening				September 5, 2020			April 30, 2019
Date of sale	Q 1 2016	Q 2 2018 -2019	Q 2 2018 -2019	Q 2 2018 -2019	Q 2 2018 -2019	Q 2 2018 -2019	Q 2 2018 -2019

Effective use of spectrum



SHARED use

Section 1 to 6.
One or two dimensions are the same

COLLECTIVE use

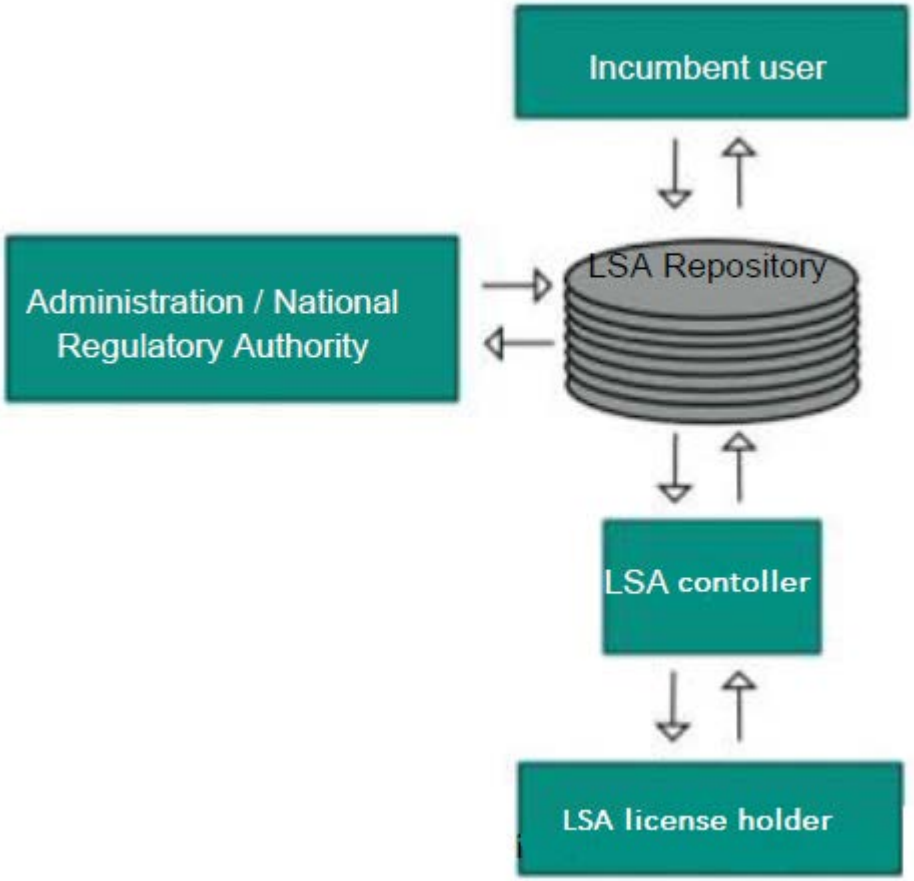
Section 7.
Each dimension is used collectively

Main concept

Shared Use	• Shared use
CUS (Common use of spectrum)	• The model for collective use of spectrum
LSA (Licenced Shared Access)	• Licensed Shared Access based on space-time sharing

Both EU level obligations and national requirements can result in the application of these

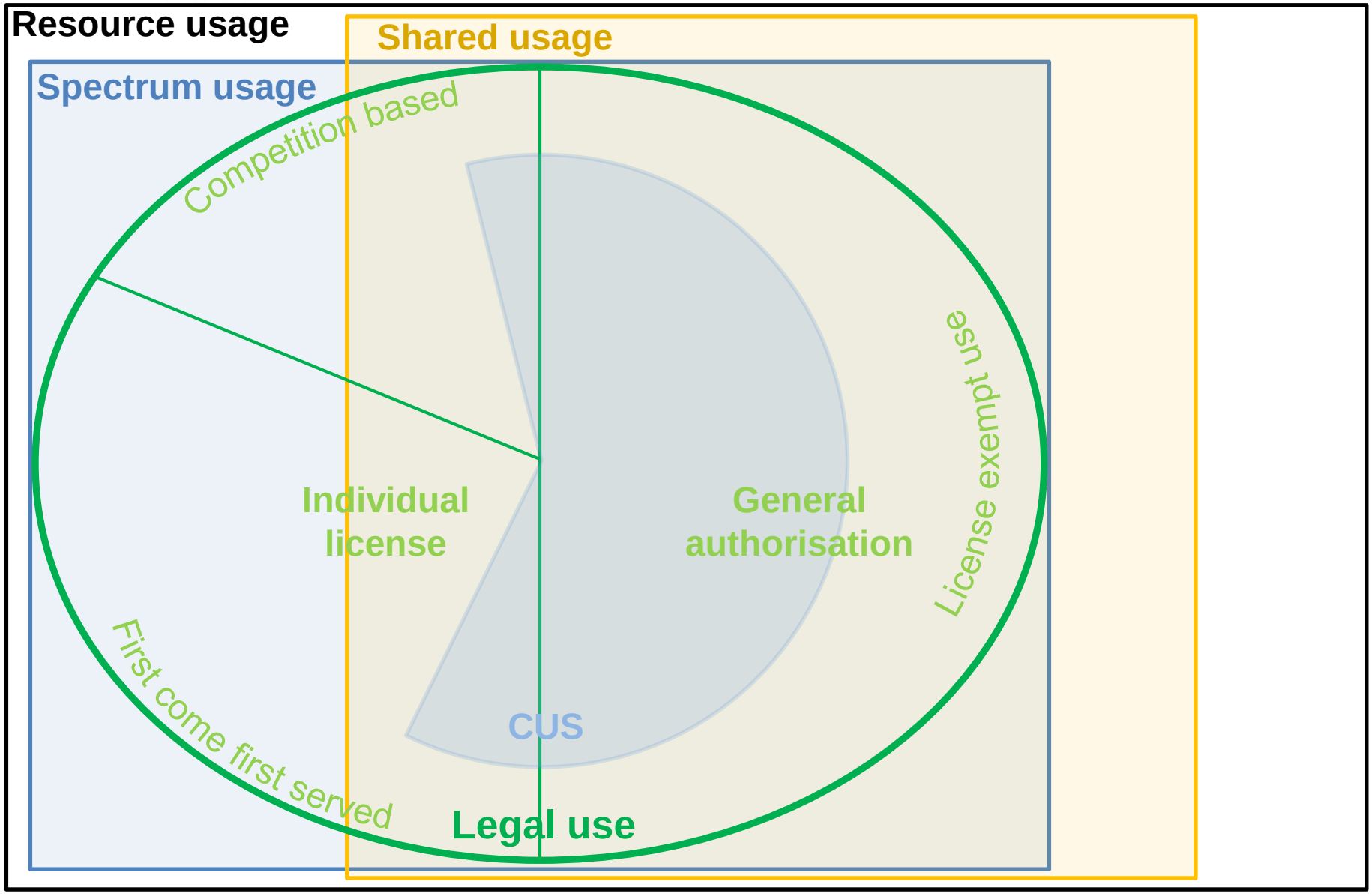
Possible operation of LSA



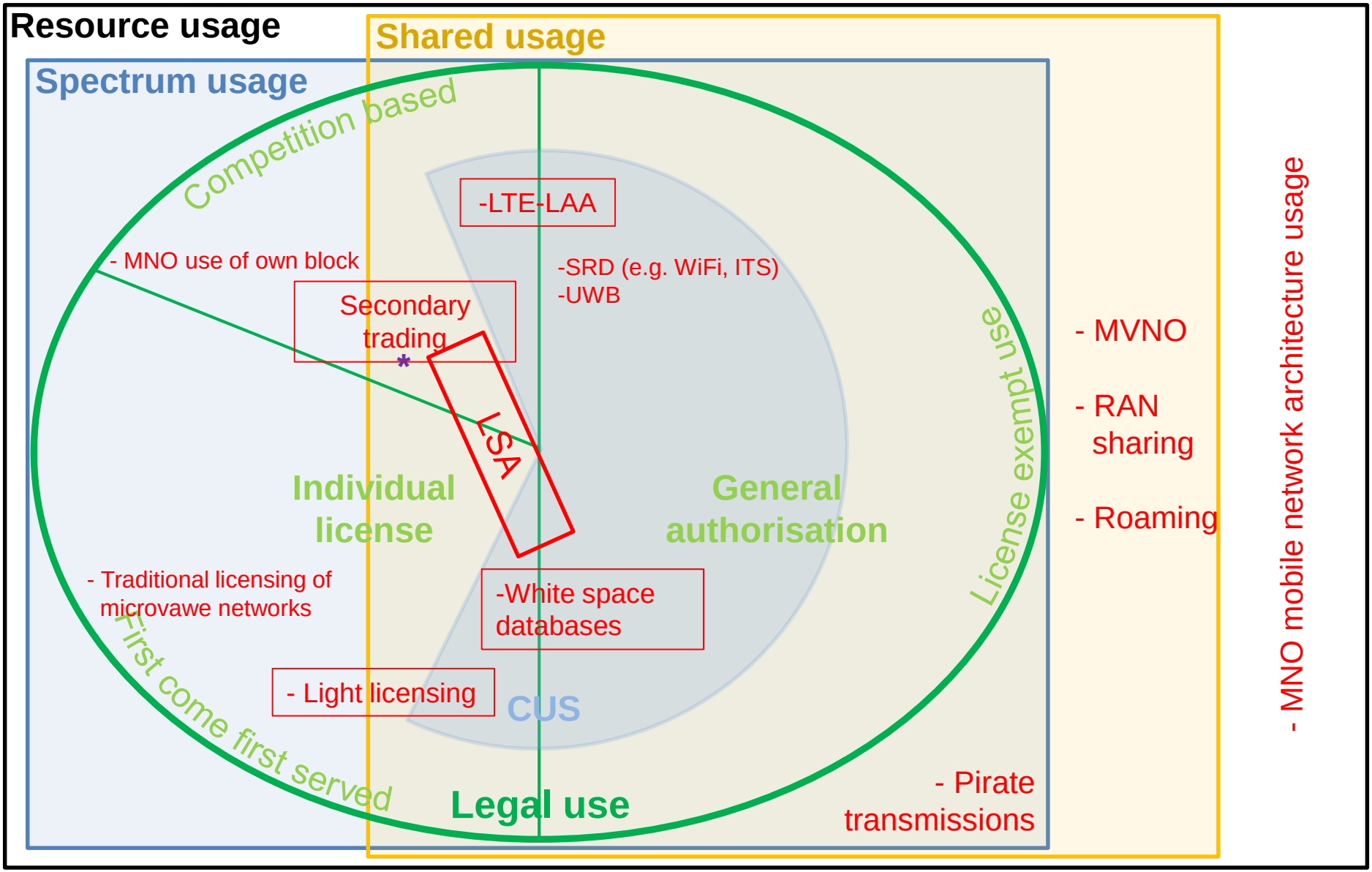
LSA data repository refers to a registry ensuring access to information on spectrum availability and relevant conditions;

- LSA operator handles access to spectrum subject to LSA licence based on :
  - a. files of incumbent frequency users stored in the repository,
  - b. rules of the sharing framework,
  - c. the band made available to the LSA licence holder;
- incumbents are band users who had already been functioning, or recognised, as such even before the LSA was introduced;
- regulations are made and maintained by the Administration, which serve as the basis for the system;
- by definition, LSA licence holders are band users who operate applications different than those run by incumbents.

Categorization of resource usage



Categorization of resource usage



* : Active RAN sharing with spectrum sharing

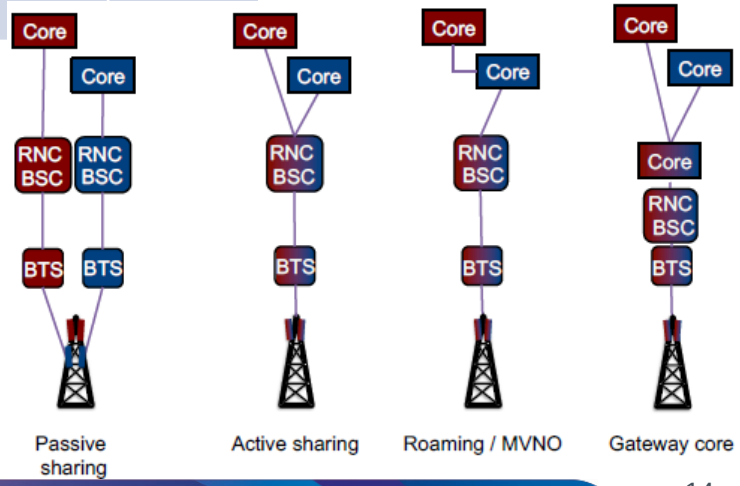
(Examples are written in red)

CUS and network sharing

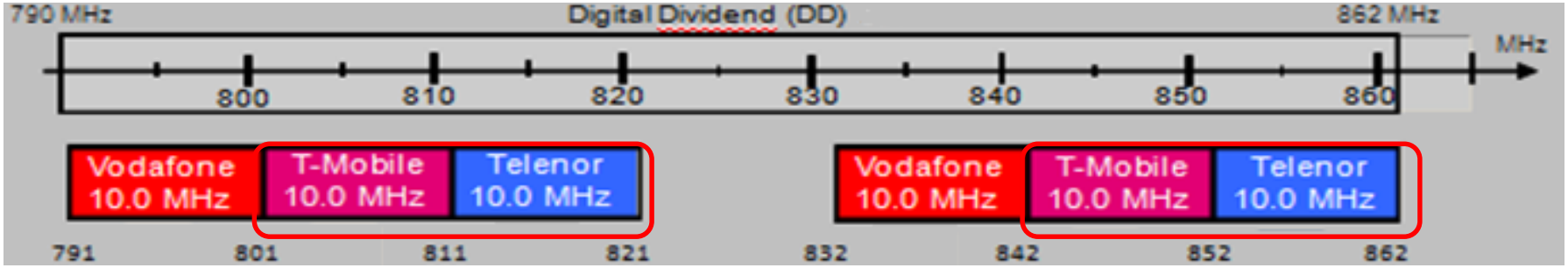
	Site	Antenna	RAN elements	Backhaul	Spectrum	Core network elements	Backbone
Passive	X						
Active RAN	X	X	MORAN, MOCN	MORAN, MOCN	MOCN		
Transmission				X			X
GWCN						X	
National roaming	X	X	X	X	X		

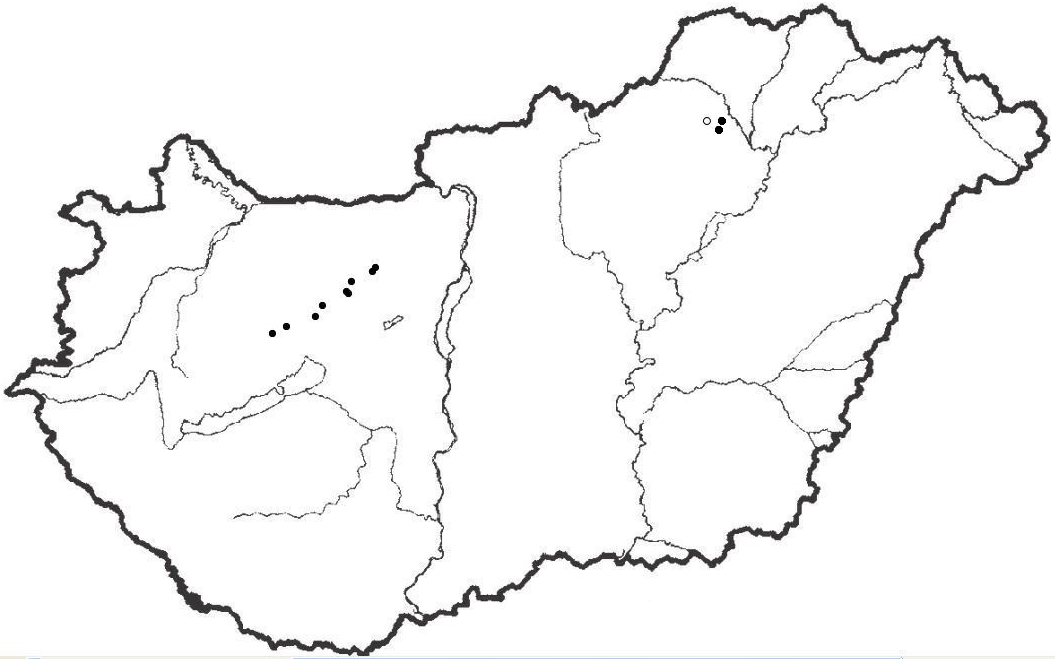
Multi-Operator Radio Access Network
Multi-Operator Core Network
Gate Way Core Network

Source: Lars R. Andersen

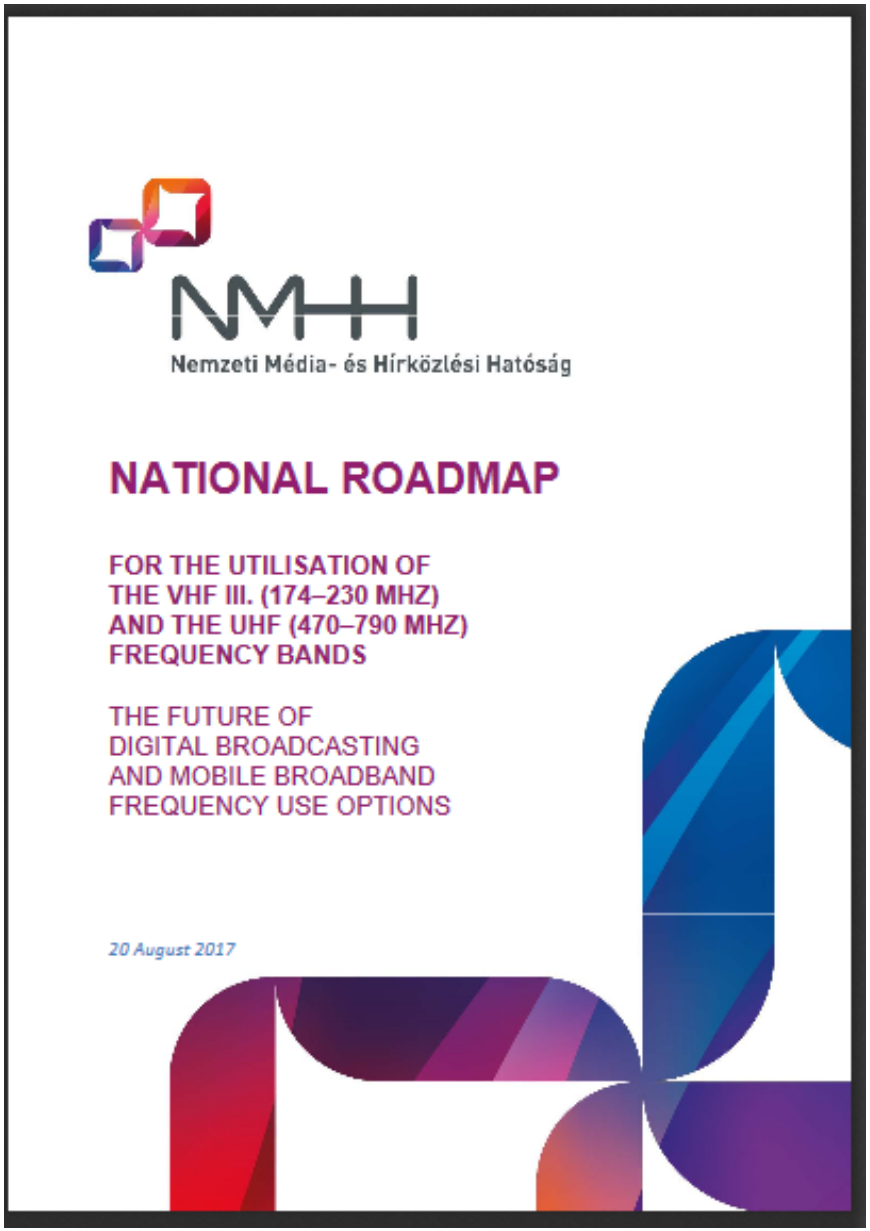


Effective spectrum usage vs. competition





OPEX, CAPEX
Available capacity for subscriber



http://english.nmhh.hu/document/190192/uhf_vhf_3_national_roadmap_eng.pdf

Issues relevant to terrestrial digital television broadcasting

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.

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.

Utilisation of the 470–694 MHz frequency range

The band must be continued to be provided for broadcasting and PMSE[13].	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

Local television broadcasting

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.

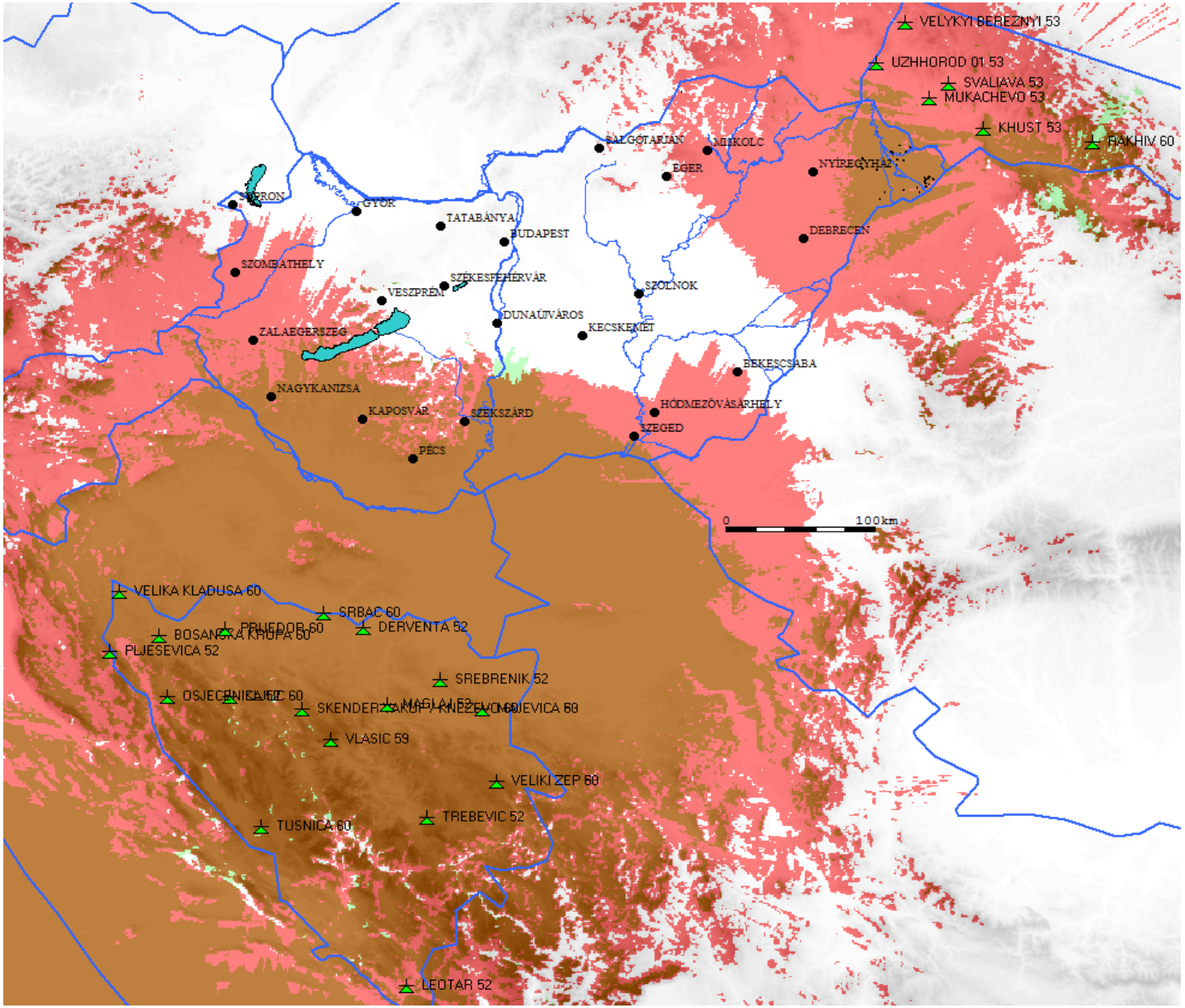
Long-term future of the 470–694 MHz frequency band

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.

International coordination

In order to **minimise the domino effe**ct 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.

723-728 MHz/ 778-783 MHz



Domino effect

Broadband mobile use

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.

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 is not planning to run a award procedure before 2020 to introduce the SDL in the duplex gap.

International coordination

Initiating MFCN (including PPDR radio application)

coordination agreements with the neighbouring countries

till 31 July 2017.

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.

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Thank you for your attention.