

MEASURES AND ACTIVITIES FOR 5G INTRODUCTION IN MACEDONIA

Evolving Regulatory Frameworks for
Digital Future

01-02/10/2018, Budva

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European 5G Action Plan

- **To develop a national 5G action plan as a part of the national Broadband Plan by the end of 2017**
- To determine at least one city in which 5G service will be enabled by the end of 2020 and then all urban areas and major terrestrial paths will have an uninterrupted 5G signal by 2025
- By the end of 2016, a temporary list of radio frequency bands should be defined in which a 5G service would be established. The list shall include radio frequencies in at least 3 spectrum bands, as follows: below 1 GHz, between 1-6 GHz and above 6 GHz in order to satisfied the wide range of 5G requirements
- By the end of 2017, all radio frequency bands (below and above 6 GHz) should be determined to enable the construction of 5G networks in Europe
- Work jointly on the recommended approach to approve the specific bands for 5G above 6 GHz while taking into account the views of BEREC and the RSPG

National Broadband Plan 1/2

- 22/09/2017-kick off meeting
 1. A public debate on the preparation of a National Broadband Plan for the development of fast and super fast electronic communications networks in Macedonia begun
 2. Invitations by MISA were sent to participate in the work of the Working Group to all stakeholders in the industry
- 05/10/2017-Letter of interest and nomination of representatives from AEC
- 16/01/2018-A Decision by MISA for the establishment of the WG (AEC is a coordinator of the WG)

National Broadband Plan 2/2

- 4 WGs:
 1. Determining the measures and activities needed for the introduction of 5G mobile technology in the Republic of Macedonia
 2. Determining draft measures for encouraging and increasing the citizens' interest in using broadband (Demand WG)
 3. Determination of free capacities and their future use in existing electronic communication network assets, built with public funds
 4. Ensuring better coordination of the mapping process on the territory of the Republic of Macedonia, with existing and planned future broadband electronic communication networks (Mapping WG)

Determining the Measures and Activities Needed for the Introduction of 5G Mobile Technology in the Republic of Macedonia 1/2

- 02/02/2018-First meeting
 1. Discuss for the volume and the content of the document
 2. Tasks to the participants of the WG to prepare input documents

- Input documents:
 1. FEEIT, FCSE and Huawei
 2. AEC
 3. Makedonski Telekom, Neotel and one.Vip

Determining the Measures and Activities Needed for the Introduction of 5G Mobile Technology in the Republic of Macedonia 2/2

- 19/03/2018-Joint meeting with the Mapping WG
 1. Discussion for the content of the input documents (difficulties related to the construction of networks, especially that in the process of building broadband networks the institutions responsible for the implementation of the construction legislation do not take or apply the provisions of the LEC; a long time to obtain a appropriate license; different procedures; etc.)
 2. Conclusion: All members of the WG to provide more precise documents

- 11/04/2018-Joint meeting with the Demand WG
 1. Discussion of radio frequencies and services related to 5G (neutrality of technologies in all ranges and increased the offer of e-services especially from the public sector)

Systematized Proposals-FEEIT, FCSE and Huawei

- Technical review
- The challenges with the construction of the small cells as well as the construction of the accompanying cable infrastructure (fiber)
- Facilitation (legal) for networks construction
- Greater digital literacy of the society
- Radiofrequencies bands
- The industry, the Government and AEC

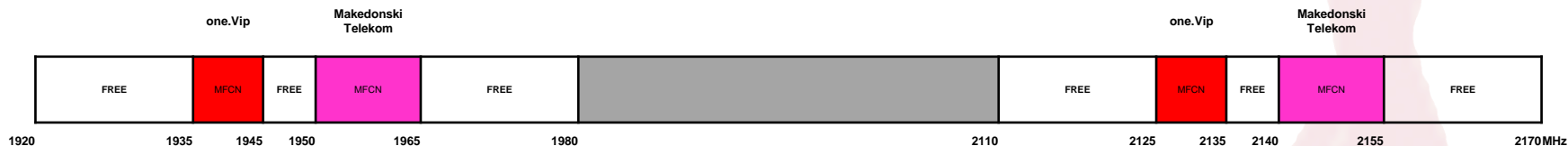
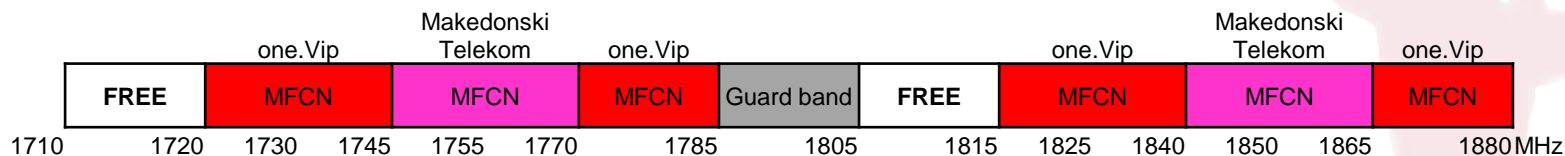
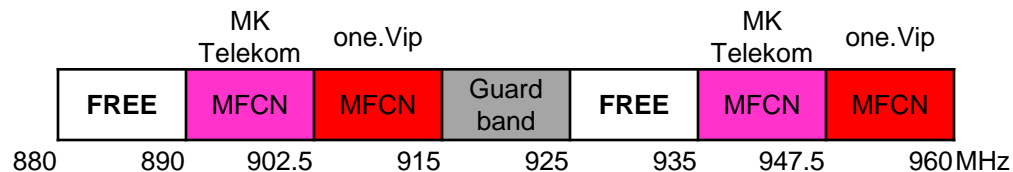
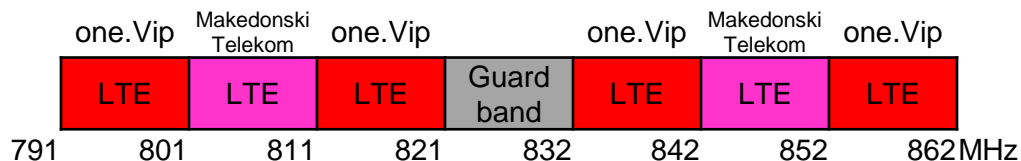
Systematized Proposals-Makedonski Telekom, Neotel and one.Vip

- Radiofrequencies bands
- Transition to DVB-T2
- Bilateral agreement with Albania (not a sign party of SEDDIF)
- Appropriate amendments in the Laws (related to construction and to spatial and urban planning) to be harmonized with LEC
- Bandwidth of the blocks (2x50 MHz or 2x100 MHz)

Systematized Proposals-AEC

- **700 MHz (694-790 MHz)**
- 800 MHz (791-821/832-862 MHz)
- 900 MHz (880-915/925-960 MHz)
- 1800 MHz (1710-1785/1805-1880 MHz)
- 1900 MHz (1900-1920 MHz)
- 2100 MHz (1920-1980/2110-2170 MHz)
- 2600 MHz (2500-2690 MHz)
- **3.5 GHz (3.4-3.8 GHz)**
- **26 GHz (24.25-27.5 GHz)**

Assignments in Land Mobile Service



700 MHz (49-60 ch)

	Digi Plus Multimedia (one.Vip)			JP MRD		one.Vip	
Allotment Zone	MUX 1	MUX 2	MUX 3	MUX 4	MUX 5	MUX 6	MUX 7
D1 Crn Vrv/Skopje	26	28	30	23	52	33	45
D1 Crn Vrv/Veles						40	47
D2 Stracin	21	41	46	37	42	50	56
D3 Turtel	22	32	43	24	39	38	55
D4 Boskija	21	37	49	34	41	57	54
D5 Pelister	25	29	33	22	37	38	42
D6 Mali Vljaj	32	39	41	26	36	44	50
D7 Stogovo	51	57	59	28	43	35	31
D8 Popova Shapka	24	34	38	27	36	41	50
License validity	04/06/2019			06/03/2022		31/05/2023	

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						Gap	SDL (A)				Downlink						Guard band
9 MHz	30 MHz (6 blocks of 5 MHz)						5 MHz	20 MHz (zero up to 4 blocks of 5 MHz)				30 MHz (6 blocks of 5 MHz)						3 MHz

700 MHz

- In accordance to the Decision (EU) 2017/899 of 17/05/2017 of the EP and the Council of the EU and the signed bilateral agreements for coordination with the neighboring countries (with the exception of Albania), the release of the 694-790 MHz band should be completed by 30/06/2020
- During 2019, AEC ex officio will make changes to the channels that operators in this range use to provide digital television services (DVB-T)
- The tender for granting licenses for radio frequency use for the band 694-790 MHz is scheduled to be announced in the second half of 2019 and the licenses will be valid from 01/07/2020

470-694 MHz National Coordination

- AEC with JP MRD and one.Vip (4 meetings)
- Fulfillment of the obligations of the Decision (EU) 2017/899 of 17/05/2017 and the signed bilateral agreements for coordination with the neighboring countries
- Possibility of transition to DVB-T2

	Digi Plus Multimedia (one.Vip)			JP MRD		one.Vip	
Allotment Zone	MUX 1	MUX 2	MUX 3	MUX 4	MUX 5	MUX 6	MUX 7
D1 Crn Vrv/Skopje	26	28	30	23	45	33	48
D1 Crn Vrv/Veles						40	47
D2 Stracin	21	32	46	24	42	37	41
D3 Turtel	22	32	38	24	39	43	44
D4 Boskija	21	37	38	34	39	41	44
D5 Pelister	25	29	33	22	37	38	42
D6 Mali Vljaj	32	39	31	26	36	44	41
D7 Stogovo	47	37	31	28	43	35	21
D8 Popova Shapka	24	34	38	27	36	41	22

Action Plan for Release of 694-790 MHz

- In accordance to Article 147 of the LEC, AEC will amend the Licenses for the use of radio frequencies in the broadcasting service, ex officio, on the channels given in the previous table
- The changes should be made during 2019
- The operators of the multiplex, by the end of 2018, will notify AEC for the dynamic plan (time period with the name of the allotment zone, transmitting locations). During the development of the dynamic plan and the implementation of the changes in the allotment zones of Stracin and Boskija, mandatory co-ordination among the holders of the Licenses for the use of radio frequencies is required in order to avoid interruption in the program
- one.Vip expresses concern about the time period for transition to DVB-T2 standard (not yet defined)
- In the rest of Europe the transition to DVB-T2 is expected between 2019-2021

NFAT

M32 M33

470 - 694 MHz

РАДИОДИФУЗИЈА **M18**

Копнена мобилна

M14

694 - 790 MHz

РАДИОДИФУЗИЈА **M18A**

КОПЕНА МОБИЛНА **M36A**

ТВ једини

ТВ радиодифузија: Женева 2006

Радио микрофони и слушни помагала: 470-789 MHz
SAP/SAB
RA: 608-614 MHz (VLBI)

ТВ радиодифузија: Женева 2006

MFCN

Радио микрофони и слушни помагала: 470-789 MHz
SAP/SAB

ERC/REC 70-03

ECC/DEC/(15)01
ECC/REC/(15)01

ERC/REC 70-03

MKC EN 300 224

MKC EN 302 296

MKC EN 302 998

MKC EN 300 744

MKC EN 300 422

MKC EN 302 296

MKC EN 302 998

MKC EN 301 908

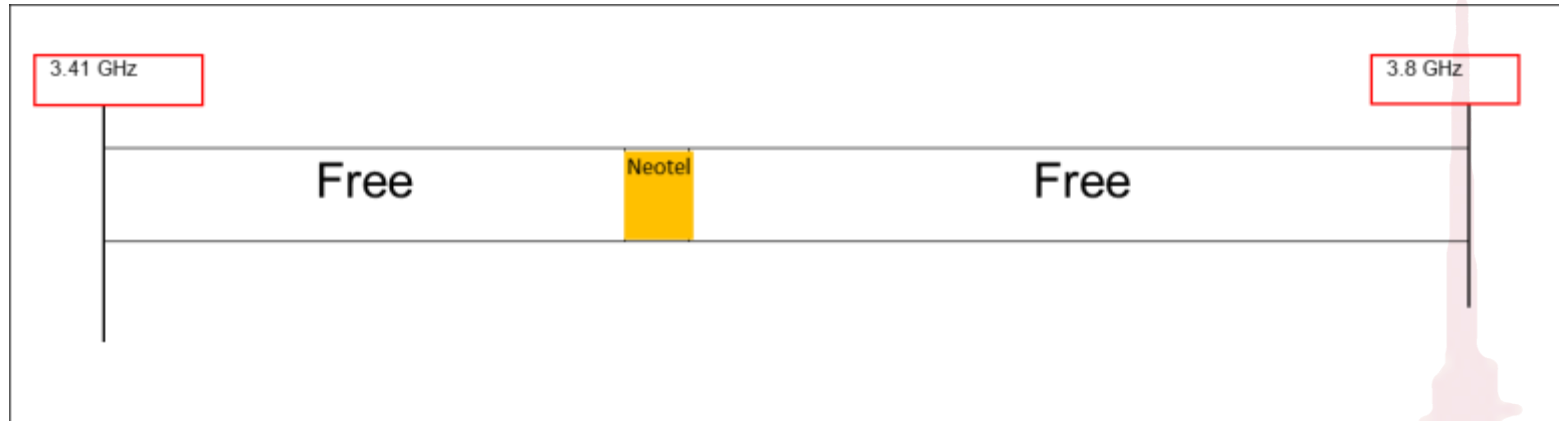
MKC EN 300 422

П Л А Н ЗА НАМЕНА НА РАДИОФРЕКВЕНЦИСКИТЕ ОПСЕЗИ ВО РЕПУБЛИКА МАКЕДОНИЈА – Агенција за електронски комуникации

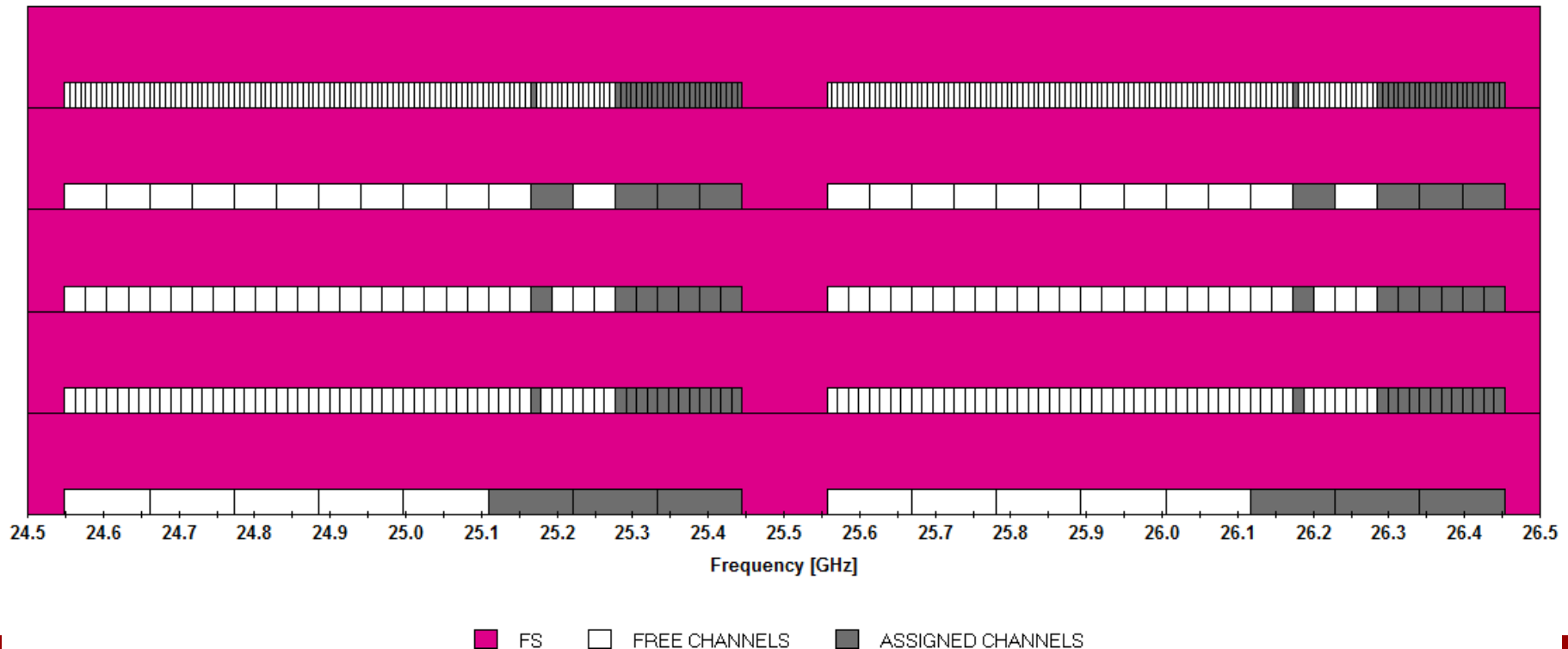
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ЦИВИЛНИ	ВЛАДИНИ	Апликации	Меѓународни одлуки и препораки	Стандарди
880 - 890 MHz				
ФИКСНА		E-GSM: ML nap co FB 925-935 MHz	ERC/DEC/(97)02	MKC EN 301 502
КОПНЕНА МОБИЛНА M37 M39			ECC/REC/(05)08	MKC EN 301 511 EN 300 609 MKC EN 301 908
		IMT (UMTS/LTE/WiMAX)	ECC/DEC/(06)13 ECC/REC/(08)02	
890 - 915 MHz				
ФИКСНА		GSM 900: ML nap co FB 935-960 MHz	ERC/DEC/(94)01	MKC EN 301 502
КОПНЕНА МОБИЛНА M37 M39			ECC/REC/(05)08	MKC EN 301 511 EN 300 609 MKC EN 301 908
		IMT (UMTS/LTE/WiMAX)	ECC/DEC/(06)13 ECC/REC/(08)02	
915 - 921 MHz				
ФИКСНА		PMR/PAMR (WB): FB nap co ML 870-876 MHz	ECC/DEC/(04)06	MKC EN 301 166
КОПНЕНА МОБИЛНА				
			T/R 25-08	
		Дигитални слушни помагала: 916.1-916.5 MHz, 917.3-917.7 MHz, 918.5-918.9 MHz, 919.7-920.1 MHz	ERC/REC 70-03	MKC EN 300 422
		RFID	ERC/REC 70-03	MKC EN 302 208
		Неспецифични SRD	ERC/REC 70-03	MKC EN 300 220
921 - 925 MHz				

3.6 GHz



26 GHz



Conclusions

- At least 3 operators in each radiofrequency band (competition development)
- Defining the minimal speed in rural areas and places under 15000 inhabitants (20/10 Mbps)
- 30 Mbps
- Participating at WRC 2019 (final determination of 5G frequency bands)
- Harmonizing the bands within CEPT during 2020
- The way of Licenses issuing (on exclusive way, sharing the telecommunications infrastructure and/or radiofrequencies resources, Licenses free,...)
- AEC together with operators in Macedonia will endeavor to follow the 5G European Action Plan
- The funds that will be paid to the Budget of Macedonia on the basis of a one-time fee will be used for building the necessary infrastructure (white zones) as well as for the possible transition from DVB-T into DVB-T2 (700 MHz)
- All telecommunications infrastructure built with public funds will be offer to the investors
- The telecommunication infrastructure in the white zones will be built by the Government
- As Annex of the document are all proposals for the amendments to the Laws related with construction

- The final document is sent to the MISA in July 2018
- Expectation is to be official till the end of 2018
- All documents (records and proposals) are published on:
<http://www.mioa.gov.mk/?q=mk/node/1559>

Thank you!