



# 5G Strategy Development in Macedonia

Jane Jakimovski  
Head of Radiocommunications Department  
Agency for Electronic Communications, Republic of Macedonia

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# 5G for Europe: An Action Plan

- **To develop national 5G deployment roadmaps as part of the national broadband plans by end 2017**
- To identify at least one major city to be "5G-enabled" by the end of 2020 and that all urban areas and major terrestrial transport paths have uninterrupted 5G coverage by 2025
- To identify by the end of 2016 a provisional list of pioneer spectrum bands for the initial launch of 5G services. The list should include frequencies in at least three ranges of the spectrum: below 1 GHz, between 1 GHz and 6 GHz, and above 6 GHz, to account for the diverse application requirements of 5G
- To agree by end of 2017 on the full set of spectrum bands (below and above 6 GHz) to be harmonised for the initial deployment of commercial 5G networks in Europe
- To work towards a recommended approach for the authorisation of the specific 5G spectrum bands above 6 GHz, taking due account of the opinions of BEREC and RSPG
- ...

# National Operational Broadband Plan

22<sup>nd</sup> September 2017 Kick off Meeting

- Public debate for preparation of National operational plan for development of fast and super fast electronic communications networks in the Republic of Macedonia
- Invitation from Ministry to participate in the Working Group

5<sup>th</sup> October 2017 Letter of interest and nomination of representatives from AEC

16<sup>th</sup> January 2018 Decision by Ministry to form a working groups

# National Operational Broadband Plan

## 4 Working Groups for:

- determining the measures and activities needed for the introduction of 5G mobile technology in the Republic of Macedonia
- determining draft measures encouraging and increasing the interest of citizens for using broadband
- determining free capacities and their future use in existing electronic communications networks and capacities built with public funds
- providing better coordination of the mapping process on the territory of the Republic of Macedonia with existing and planned future broadband networks

# 5G mobile technology WG

## 2 February 2018 First meeting

- Discussion about the scope and content of the document
- Task to the members of the group to prepare input documents

## Input documents received by:

- Operators: MT, One.Vip and Neotel
- Regulators: AEC
- Universities and Manufacturers: FINKI, FEIT and HUAWEI

# 5G mobile technology WG

19 March 2018 Second meeting of the WG (together with the WG for mapping)

- Discussion about input documents (most of them are about the problems regarding the construction of the networks and a long time for obtaining a building permit)
- Conclusion: All members of the group to provide more detailed documents

11 April 2018 Joint meeting with the WG for determining draft measures encouraging and increasing the interest of citizens for using broadband

- Discussion about the radiofrequencies and services related with 5G (neutrality of technologies in all frequency ranges and increased offer of e-services, especially from the public sector)

# Input Documents

## FINKI, FEIT and HUAWEI

- Technical review
- Challenges with the construction of small cells as well as construction of the appropriate cable infrastructure (optics)
- Facilitation (legal) for building networks
- Greater digital literacy of society
- Frequency bands
- Industry, Government and AEC

# Input Documents

## MT and Neotel

- Frequency bands
- Switch to DVB-T2
- Bilateral agreement with Albania (not a signatory of SEDDIF)
- Appropriate changes in the Laws (for building, spatial and urban planning) in order to harmonize with the LEC
- Block width for 3.5 G (2x50 MHz or 2x100 MHz)

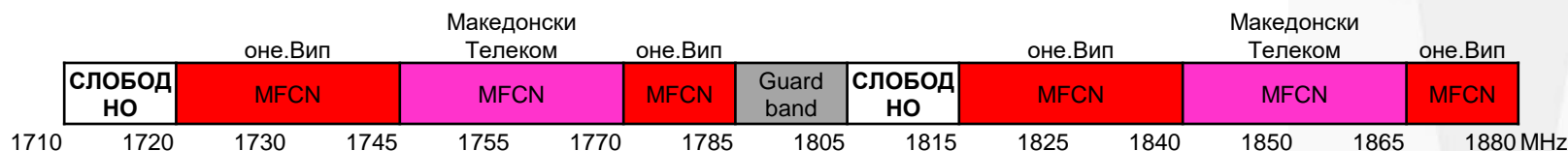
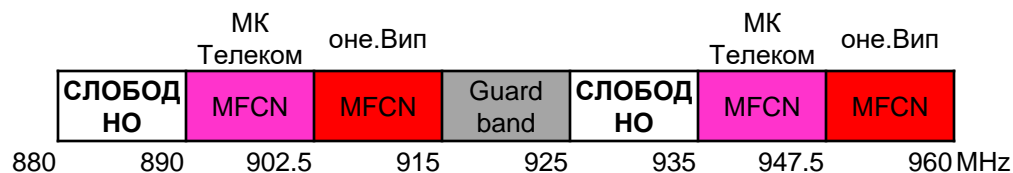
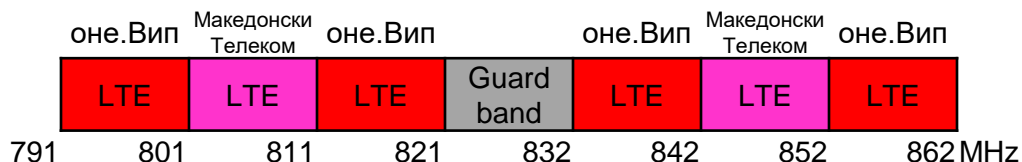


# Input Documents

## 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)
- 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 the Land Mobile Service for ECN



# Spectrum for 5G

Harmonization and timely availability of spectrum are the cornerstones for the success of 5G. In accordance with RSPG opinion, for Macedonia there are three pioneer frequency bands:

- 694-790 MHz band: This band will be harmonized in 2020 and would enable nationwide and indoor 5G coverage
- 3.4 – 3.8 GHz band: This band is already harmonised within Europe for Mobile/Fixed Communication Networks (MFCN) and is primary band for early 5G developments in Europe.
- 24.25-27.5 GHz: Due to the fact that 5G envisages very high data rates, much larger bandwidths than ever before will be required (up to several GHz), which can only be found in higher frequency bands above 24 GHz. To respond to this demand, ECC has identified the band 24.25-27.5 GHz (called the 26 GHz band) for early European harmonisation, as it provides over 3 GHz of contiguous spectrum and more favourable propagation than the higher frequency bands under consideration.

# 5G in Macedonia: 700 MHz band

- At the moment DVB-T frequency authorizations according to the GE06 Agreement
- Pursuant to Decision 2017/899 of 17/05/2017 of the EP 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 at the latest
- In the course of 2019, the 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 authorizations for radio frequency utilization for the band 694-790 MHz is scheduled to be announced in the second half of 2019, and the approvals will be valid from 01/07/2020

# 5G in Macedonia: 3.6 and 26 GHz



# AEC proposals

- At least 3 operators in each range (competition development)
- Determination of minimum speed in rural areas and populated areas below 15000 inhabitants (20/10 Mbps)
- Participation on the WRC2019 (definition of 5G bands) and Harmonizing the bands
- Granting of Authorisations (on an exclusive basis, on the basis of joint use of the telecommunication infrastructure and / or radio frequency resources, exempt from the Authorisations, ...)
- AEK together with operators in Macedonia will endeavor to follow the 5G European Action Plan
- The funds that will be paid to the account of the Budget of Macedonia on the basis of a one-time frequency fee to be used for building the necessary infrastructure so that the necessary service can be provided for the services provided by the operators as well as for the required transition from the DVB-T to DVB-T2
- The entire telecommunications infrastructure that is built with public funds will be offered to investors
- Additional proposal from the AEC on 16/04/2018 to supplement the LEC in the extension of the validity of the frequency authorisation (regulatory predictability)

# AEC and MIOA measures and tasks

Status of the tasks presented on the IRC 2017:

- To develop national 5G deployment roadmaps as part of the national broadband plans by end 2017 (Ministry) **UNDER DEVELOPMENT**
- Harmonize spectrum within CEPT and implement it into our legislation (AEC) **HARMONIZED, BUT WAITING FOR THE RESULTS OF WRC-19**
- Finish the SEDDIF work and free the 700 MHz band (AEC and Ministry) **SEDDIF WORK FINISHED, PLAN FOR FREE 700 BAND UNDER DEVELOPMENT**
- Rearrange the PP links in 26 GHz band in order to have more available spectrum (AEC) **EXECUTED**
- Decision on licensing model for each frequency band (exclusive, shared, license exempt) and update the Electronic Communications Law (AEC and Ministry) **UNDER DEVELOPMENT**

# Proposed timeframe

All input documents will be considered in detail

- Within 1 month, the draft text will be launched (10/06/2018)
- 1 month publication of the text for a public hearing (10/07 - 10/08/2018)
- Final document (September 2018)

All documents (minutes of the meetings and proposals) are available at:

<http://mioa.gov.mk/?q=node/4563>



# Discussion

