ITU-EKIP Regional Regulatory Forum for Europe

Universal Connectivity for a Post-Pandemic Digital Europe

Developing 5G ecosystem in Montenegro

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Overview of mobile networks in MNE

- Five bands in use: 800 MHz, 900 MHz, 1800 MHz, 2 GHz and 2.6 GHz
- Technology: 2G (GSM/GPRS/EDGE), 3G (UMTS/HSPA+/DC-HSDPA), 4G (LTE/LTE-Advanced – up to 3GPP Release 13)
    - 2x2 MIMO, 4x4 MIMO on few sites
    - 2CA (30/40 MHz) or 3CA (40/50 MHz) on many sites
    - no VoLTE, NB-IoT in few sites
- Voice traffic in cities: <5% by GSM, >95% by UMTS
- Data traffic in cities: <0.5% by UMTS, >99.5% by LTE
- LTE basic coverage (RSRP ≥ -120 dBm): >97.5% of population
- LTE (10 Mb/s DL) coverage (RSRP ≥ -112 dBm): ~97% of population
- Urban areas DL date rate (MTEL June 2021) –
  Average: ~60 Mb/s / 90% of FTP sessions: >17 Mb/s

Activities regarding 5G in MNE

- No commercial 5G operations in MNE

- Only one 5G test (June 2021) – CT, 2 GHz DSS, only Gb/s data rate tested

- Survey regarding strategy for implementation of 5G networks – Q4 2020

- Study on strategy for implementation of 5G networks in MNE – Q1 2021

- Allocation of spectrum in the pioneer 5G bands – Q4 2020-Q1 2021

- Survey regarding auction of available spectrum for MFCN – Q4 2020

- Spectrum auction 2021 (renewal + 2.6 GHz free) - to be started in Oct 2021

- Spectrum auction for pioneer 5G bands – H2 2022

- Guidelines for 5G NR BS authorisation regarding EMF exposure – H1 2022

Survey regarding strategy for implementation of 5G networks

- Call to various stakeholders (more than 100) to provide their own views regarding awareness of the possibilities of 5G technology, interest in use of 5G services, potential scenarios for the use of 5G networks in their business processes, potential benefits, challenges, limitations and barriers for the implementation of 5G mobile networks in MNE

- Based on the responses received by 27 entities we concluded:

- There is very low awareness of the potential of 5G, possible user scenarios and benefits from 5G, except at MNOs

- MNOs are interested to deploy 5G network without any obligation regarding coverage and QoS, first eMBB service and later other types of 5G services based on market demand

- As a main obstacle MNOs indicated complex, inefficient and time wasting procedures for construction of base stations and for access to state owned land

- EMF exposure, cyber security and data protection are indicated as potential main risks regarding 5G

- The Study is expected to identify technological, regulatory, security, spectral and structural challenges, constraints and barriers to the deployment of 5G mobile communications networks and the development of 5G infrastructure and to provide appropriate guidance to enable the deployment of 5G mobile networks in Montenegro by the end of 2022 at the latest

- The study is structured as an integral document which provides 22 recommendations and action plan for 5G in 8 steps – ideal as a base for national 5G strategy

- Identifies activities and subjects which are in charge to deal with – EKIP, Ministry, other ministries, Government, other public institutions

- Many of activities are out of power of EKIP → **for success of the process coordination from the governmental level needed**

Action plan for 5G in 8 steps:

1) Harmonisation of the regulatory framework with the EU framework
2) Allocation of the adequate radio-frequency resources
3) Realisation of the 5G pilots and test projects
4) Auction of the spectrum
5) Reform of the legislative framework for infrastructure construction and deployment of electronic communication networks
6) Arising awareness of the benefits and adequate communication of the risks
7) Implementation of ENISA regulation regarding cyber security
8) Capacity building within all stakeholders

The Study also provides communication strategy towards public regarding EMF exposure, cyber security, data protection and conspiracy theories related to 5G

Availability of the RF spectrum for 5G

- New National frequency allocation plan has been adopted in 2020 – new bands 26 GHz, 40 GHz and 66 GHz have been identified for MFCN

- Channel arrangement and LRTC for 5G NR in the bands 700 MHz, 3.5 GHz and 26 GHz, as well as 2 GHz and 2.6 GHz, has been defined based on relevant CEPT/ECC decisions

- Band 700 MHz is free, but its usage for 5G is limited due to interference from DTV transmitters in ALB and ITA (deadline for release: June 30th 2022 ???)

- Band 3.6 GHz available for 5G from april 2022

- In the band 26 GHz available 1000 to 2200 MHz for 5G

Survey regarding auction of available spectrum for MFCN

Available RF spectrum for MFCN to be auctioned

- Renewal: 900 MHz (2x10 MHz), 1800 MHz (2x20 MHz), 2 GHz (2x15 MHz)

- Free: 1500 MHz, 2 GHz (2x5 MHz), 2.3 GHz, 2.6 GHz (2x40 + 40 MHz)

- Pioneer 5G: 700 MHz, 3.6 GHz, 26 GHz

Survey to MNOs regarding auction of available spectrum for MFCN

- Strong interest only for 3.6 GHz band, less for 700 MHz and 2,6 GHz bands

- No interest for 1500 MHz, 2.3 GHz and 26 GHz bands in mid term

- Mobile operators (2 of 3) are ready to invest in 5G spectrum rather in 2022 than in 2021, due to effects of COVID-19 pandemic on their incomes

Spectrum auction 2021

Extension of the MNE spectrum auction 2016

- Renewal in pre-aution: 2x10 MHz @ 900 MHz, 2x20 MHz @ 1800 MHz, 2x15 MHz @ 2 GHz

- Free blocks in main auction: 2x5 MHz @ 1800 MHz (from pre-auction due to spectrum cap), 2x5 MHz @ 2 GHz, (2x40 MHz + 40 MHz) @ 2.6 GHz

- Validity period: from Dec 2021 to September 1st 2031 (~10 years)

- Simple "clock" auction with additional round for unawarded blocks (manual bidding)

- Public consultations ended on September 10th, Report will be announced on October 1st 2021

- Public bidding process to be started on October 20th 2021 at the latest

- Approvals to be issued in December 2021 or January 2022

Spectrum auction 2022

- Spectrum to be auctioned
  - 700 MHz (2x30 MHz FDD + up to 20 MHz TDD/SDL)
  - 3.6 GHz (400 MHz TDD)
  - 1500 MHz (90 MHz SDL) ???
  - 2.3 GHz (100 MHz TDD) ???
  - 26 GHz (1000 MHz TDD) ???
- Consultancy service and SW for electronic bidding - public procurement process in progress – to be finished until the end of 2021
- Information document to be announced in Q2 2022
- Auction process to be started in Q3 2022

Conclusions (1/2)

- Implementation of 5G networks and services will be gradual → in the early stage only eMBB (multi Gb/s data rates) will be supported, other type of 5G services (UR-LLC and mMTC) will be introduced later

- LTE/LTE-Adv/LTE-Adv Pro will remain dominant mobile technology at least in the next five years → further enchantments are needed

- GSM, (UMTS?), LTE and 5G NR networks will operate in parallel → more operational complexity and costs

- There is no uniqe strategy or approach for efficient implementation and sustainable development of 5G networks and services on each market → 5G ecosystem should be developed based on characteristics of local market → sinergy of mobile and IT indusrty, other vertical industries, public sector and academic society is needed

Conclusions (2/2)

- The overal objective in MNE:

  Commertialy available 5G services until the end of 2022!

- To reach this objective a lot of activities should be done by various subjects
  → **National 5G strategy and action plan to be addopted as soon as possible**

- Spectrum auction in the bands 2 GHz and 2.6 GHz in 2021 will allow mobile operators to launch 5G before pioneer 5G bands become available

- Spectrum auction in the bands 700 MHz, 3.6 GHz and 26 GHz in 2022 will allow mobile operators to deliver full potential of 5G networks and services

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Thanks for your attention!!!

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