Transition to Digital Terrestrial Television Broadcasting and Digital Dividend in Montenegro

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MONTENEGRO

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Legal framework

Transition from analogue to digital broadcasting in Montenegro has been regulated by the following legislation:

  Agency for Electronic Media (AEM) is authorised to award licences for provision of AVM services - programme licences for terrestrial including digital and non-terrestrial platforms, licences for the provision of on-demand AVM services.

- **Law on Digital Broadcasting (2011, 2012)**
  Method and conditions for implementation of digital terrestrial broadcasting in Montenegro, switchover period and other matters of importance in this field.
  Provisions related to: network planning, status, rights and obligations of network operator and multiplex operator, provisions of funds for digital terrestrial broadcasting, switch-off date, rights and obligations during switchover period, supervision and other issues.
  Regulations in the field of electronic communications and electronic media shall apply accordingly to the matters relating to digital broadcasting, which are not regulated under this Act.

- **Law on Electronic Communications (2013)**
  Management and use of electronic communications networks including broadcasting networks, inter alia allocation and use of radio-frequencies

Regulatory authorities:
- Agency for Electronic Communications and Postal Services (EKIP)
- Agency for Electronic Media (AEM)
Technical framework

Geneva 06 (GE06) Agreement
The Plans for VHF/UHF analogue and digital broadcasting in parts of Regions 1 and 3, in the frequency bands 174-230 MHz and 470-862 MHz

Digital Broadcasting Plan at national level
Endorsed by Agency in accordance with Law on Digital Broadcasting in 2011 and includes:
- Plan for digital terrestrial television broadcasting (initially 7 layers in the UHF and 1 layer in the VHF 3 allotment and 1 suballotment area)
- Plan for digital terrestrial audio broadcasting (3 layers for digital radio in VHF 2 allotment areas)

Planning methods:
- allotment & assignment

Standards
ITU-T H.264/AVC (MPEG-4 Part 10) & DVB-T2

<table>
<thead>
<tr>
<th>Allotment area name</th>
<th>174 - 230 MHz (ch 5 - ch 12)</th>
<th>470 - 694 MHz (ch 21 - ch 48)</th>
<th>694 - 790 MHz (ch 49 - ch 60)</th>
<th>790 - 862 MHz (ch 61 - ch 69)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIJELASICA</td>
<td>6 10A, 11A, 12A</td>
<td>25, 29, 37, 43</td>
<td>60</td>
<td>62, 68</td>
</tr>
<tr>
<td>LOVCEN</td>
<td>8 10B, 11C, 12C</td>
<td>27, 31, 35</td>
<td>57</td>
<td>61, 64, 67</td>
</tr>
<tr>
<td>TVRDAS</td>
<td>6 10A, 11A, 12A</td>
<td>22, 26, 32, 46</td>
<td>49, 53, 55</td>
<td></td>
</tr>
<tr>
<td>PODGORICA</td>
<td></td>
<td>21, 24, 30, 33, 38, 39, 44</td>
<td>53</td>
<td>69</td>
</tr>
</tbody>
</table>

Project: South-East European Digital Television (SEE Digi.TV) technical documents (EKIP & ETF) to be used by relevant authorities:
- Technical basis for adoption of Montenegrin standards (MEST) for the purpose of implementation of digital terrestrial broadcasting systems
- Technical support to develop national specification based on regional receiver specifications and conformance test specifications
Economic framework
ASO date (amendments to Law on Digital Broadcasting) postponed for 17th of June 2015
Subsidy scheme for set-top boxes either for entire population or for any specific target group(s) - not prescribed so far
The first MUX will be free-to-air, Pay TV might be available for other MUXs

Public awareness
Operative information campaign has not been started so far it has been expected in near future

Current situation

Population approximately: 625,000 citizens; 195,000 households (HH)
Most of the HH using non-terrestrial platforms have access to digital services

A demand for radio and TV programme via non terrestrial service is different in regions
Ist MUX implementation

PSB Radio and Television of Montenegro is awarded the right to access the first national coverage network, without conducting public call procedure.

For commercial providers of audiovisual media services, the right to multiplex access shall be realized through a public call, in accordance with the Law on Electronic Media.

Terrestrial analogue TV
National: 2 PSB, 6 commercial programmes
Local: 3 PSB, 11 commercial programmes

The Broadcasting Center - transmission and broadcasting of the national implemented through IPA project
Support to the Digitalisation of the Montenegrin Public Broadcasting
Total Budget / EC contribution: €2,695,000/1,600,000

DVB-T2 trial network implemented

I phase 2013:
• Alotment area Lovcen
  24 transmitters (CH 35)
• Suballotment area Podgorica
  2 transmitters, 1 gap filler (CH 24)
• Alotment area Bjelasica
  12 transmitters, 2 gap fillers (CH 43)
• Alotment area Tvrda
  2 transmitters (CH 49)

II phase 2014

<table>
<thead>
<tr>
<th>Network parameters</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bandwidth</td>
<td>8 MHz</td>
</tr>
<tr>
<td>FFT Size</td>
<td>32K</td>
</tr>
<tr>
<td>Guard interval</td>
<td>1/16</td>
</tr>
<tr>
<td>Pilot Pattern</td>
<td>PP2</td>
</tr>
<tr>
<td>Consellation</td>
<td>256-QAM</td>
</tr>
<tr>
<td>Code Rate</td>
<td>3/5</td>
</tr>
<tr>
<td>Network bit rate</td>
<td>31.87 Mbit/s</td>
</tr>
</tbody>
</table>
Study on digital dividend exploitation possibilities in Montenegro

The study provide:

- An overview of the current situation of the broadcasting market in Montenegro and the mobile communications market;
- A presentation of the intended and current use of the radiofrequency spectrum in the bands 174-230MHz, 470-790MHz i 790-862MHz;
- The definition and assessment of the “quantity” of the digital dividend in Montenegro, which implies all available spectrum in the observed frequency bands remaining after the switch-over of the existing TV channels from analogue to digital broadcasting;
- A presentation of the already developed and future technologies that can be applied for services in the digital dividend spectrum, and their basic characteristics.
- The analysis of the required spectrum that have to be insured for the introduction of the individual new radiocommunication technologies, implementation of EC networks as well as EC and AVM services;
- Assess market stakeholders’ interests and needs in relation to the expansion of the existing services and the introduction of new services, and identify their requests and preconditions for the introduction of a new radiocommunication technologies, implementation of EC networks as well as EC and AVM services.
- Presentation of experiences from European countries and give several examples of good practice of the implementation of new services, applicable with regard to the size and the structure of the market.
- Presentation of the possible scenarios for individual bands: 174-230MHz, 470-694MHz, 694-790MHz and 790-862MHz which includes the identification of all preconditions and changes in regulations necessary for the implementation of a scenario, timeframe and weaknesses, threats, opportunities and strengths of each scenario.
- An overview of network convergence issue, possibilities to overcome actual separation on mobile/fixed/broadcasting networks, with regards to complementary of AVM and EC services, potential and consequential development of traditional business models and market demands, new approaches to spectrum management in general;
- Recommendations for digital dividend exploitation possibilities.
Possible scenarios for individual bands
SWOT, RECOMMENDATIONS

- **174-230 MHz**
  - S1: DVB-T2
  - S2: DAB/DAB+, RECOMMENDED

- **470-694 MHz**
  - S1: DVB-T2, RECOMMENDED

- **694-790 MHz**
  - S1: DVB-T2
  - S2: Mobile, RECOMMENDED, to be considered after WRC-15 for Mobile EC

- **790-862 MHz**
  - S1: DVB-T2
  - S2: Mobile, RECOMMENDED

Radio Frequency Allocation Plan 2014
based on Radio Regulations, provisions from WRC-12 including EU regulation
Thank you for your attention

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