

# DBBT

Digital Broadcasting &  
Broadband Technologies

Co-funded by the  
Erasmus+ Programme  
of the European Union



## JP EMISIONA TEHNIKA I VEZE



Invitation Lectures, Belgrade 12.05.2018 –VISER



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ЕМИСИОНА ТЕХНИКА И ВЕЗЕ

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## AGENDA

**Introduction**

**Services**

**Resources**

**Key issues for 2018**



EMISIJNA TEHNIKA I VEZE



## INTRODUCTION

JP Emisiona tehnika is an innovative, client oriented telecommunication company with focus on wireless services.

Owner	Public Enterprise
Main business activity	Nationwide terrestrial television and radio broadcasting
Major Customers	Public and commercial broadcasting services and telco operators
Full time employees	277





## MILESTONES

2005

**SDTV** – start in April 2005 – Avala – 27 Ch; November 2005 – Crveni Cot – 31 Ch  
4 Programs – RTS1, RTS2, TV Avala and RTS Digital

2009

Start with HDTV – start in September 2009 – Avala – 27 Ch; in October 2009  
Founded by Government of Republic of Serbia

2011

Formally started in 2011, 01. January

2012

21.03.2012 start with DVB-T2 terrestrial Services  
(Initial and Simulcast Network)

2015

07.06.2015 analogue switch of



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# SERVICES

<h3>DVB-T2 broadcasting</h3> <ul style="list-style-type: none"><li>▪ FTA transmission</li><li>▪ Pay TV service</li></ul>	<h3>Analogue and digital terrestrial radio broadcasting</h3> <ul style="list-style-type: none"><li>▪ Nationwide transmission for FM, AM bands</li><li>▪ DAB+ (planned)</li></ul>	<h3>B2B telecommunication</h3> <ul style="list-style-type: none"><li>▪ B2B telco services</li><li>▪ Site hosting</li><li>▪ Network maintenance</li></ul>	<h3>Network services (MW links)</h3> <ul style="list-style-type: none"><li>▪ 2 x 160 Mbps</li><li>▪ 4 and 8 GHz</li><li>▪ Configuration 2+0</li></ul>	<h3>Laboratories and Measurement equipment's</h3> <ul style="list-style-type: none"><li>▪ Laboratories</li><li>▪ Measurement vehicle</li></ul>
				
<ul style="list-style-type: none"><li>▪ 230 broadcast locations countrywide</li></ul>	<ul style="list-style-type: none"><li>▪ 49 FM locations</li><li>▪ 1 digital radio transmission towers</li></ul>	<ul style="list-style-type: none"><li>▪ Extensive wireless backbone and access network</li></ul>	<ul style="list-style-type: none"><li>▪ 46 MW links on 38 locations</li><li>▪ Red and blue network</li></ul>	<ul style="list-style-type: none"><li>▪ TV analyzer, Vector analyzer</li><li>▪ Monitoring receiver</li><li>▪ BC Drive software</li></ul>

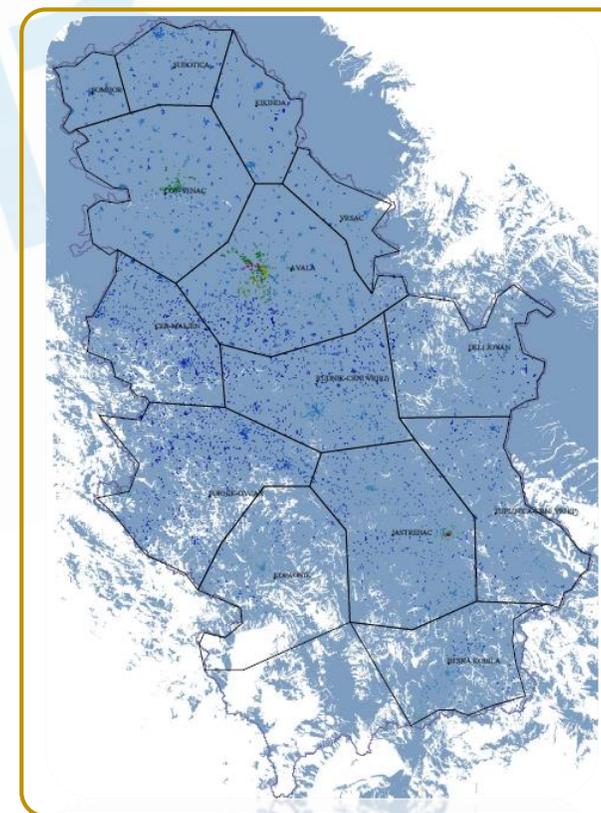


# DVB-T2 BROADCASTING



Countrywide (98.37%) DVB-T2 coverage – MUX 1

	Free (MUX 1/MUX 2)	PayTV (MUX 3)
<b>Service launch</b>	Jun 2015	Septembar 2016
<b>Technology</b>	DVB-T2 MPEG-4	DVB-T2 MPEG-4, Conax
<b>Channels</b>	8/(5-20)	26
<b>Network parameters</b>	SFN, 32k ext, CR-2/3, GI-1/16, SISO, PP4, Fixed Reception	SFN, 32k ext, CR-3/4, GI-1/16, SISO, PP4, Fixed Reception
<b>Other features</b>	<ul style="list-style-type: none"> <li>Application: EPG, OTA, etc.</li> <li>HbbTV: live channels, EPG, VOD, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Pre-paid service</li> <li>In future - Thematic mini packages</li> </ul>
<b>Bit rate</b>	36,97 Mbit/s	41,59 Mbit/s



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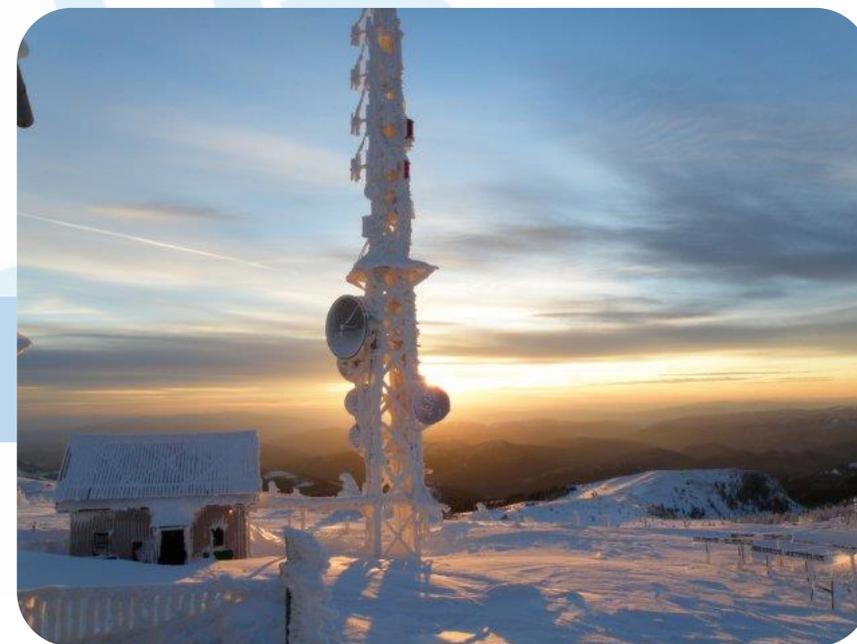
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ЕМИСИОННА ТЕХНИКА И ВЕЗЕ



**Extensive portfolio of high quality assets providing unique market position**

## Sites

- Almost 230 sites

## DVB-T2 network

- 3 multiplexes with 98% coverage

## Radio network

- Contrywide analogue FM radio network
- Radio in DVB-T2 network

## Microwave network

- High-speed digital microwave backbone network + transport network for end users

## B2M

- Telco service, infrastructure, site hosting

## Measurements

- Measurement laboratories and equipment

## Licenses

- Long-term frequency licenses in FM, UHF and SHF bands, 3 multiplexes for digital terrestrial broadcasting





## HUMAN RESOURCES

Employees with high experience regarding broadcasting and wireless communication

- **Headcount:** 277+
- **Average age:** 48
- Proportion of employees with higher education: 37%
- Distribution of physical / intellectual workers: 50-50%



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## ACTIVITIES IN 2018

Based on its countrywide networks ETV plan is to introduce new services and could provide different wireless infrastructure and maintenance services

Bandwidth need

Transmission range

### Radio over DVB-T2 network

- Programs of Radio Beograd is now available on DTT platform in MUX 1
- Radio signal is present in all allotment zones
- Countrywide covering same as digital TV



### Rebuilding of FM Network

- Two capital Project – Coverage and Implementation Plan for new FM network
- 3 FM network for Public Broadcast Services
- ETV is responsible for network deployment, installation and maintenance**



### Additional capacity in FX

- Increasing capacity in IP network to 480 Mbits/sec**
- Adding at least one RF channel
- Reconfiguration of existing network
- Migration to a new generation of equipment





# NEW SERVICES IN FUTURE

Based on its countrywide networks ETV plan is to introduce new services and could provide different wireless infrastructure and maintenance services

bandwidth need

Transmission range

## T-DAB – DAB+

- DAB+ - new services, new content; up to 16 stations in one block, Hybrid Radio – Radio DNS
- In 2018 – Avala – pilot project, 2019 – 6 locations countrywide
- **ETV is responsible for network deployment and maintenance**
- Whats are the benefits of digital radio for listeners?

## LPWA network, as a new opportunity

- JP ETV considering technology implement low power wide area IoT use cases
- Main goal is ti provide high quality services in the field of IOT
- Eventually a countrywide network is considered
- The basis for new services and measure (smart parking, passenger counting, smart metering – water, gas, electricity)
- Simply makes everyday taska easier



## HbbTV

- HbbTV works in all DVB broadcast network
- Internet and TV is becoming united
- Internet is pushing onto TV screen in many ways...
- Many croos-linking options between broadcast and broadband



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## Questions?

# Thanks four your attention!



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