NATIONAL MEDIA AND INFOCOMMUNICATIONS AUTHORITY•HUNGARY

Regional Workshop for Europe and CIS on Spectrum Management and Transition to Digital Terrestrial Television Broadcasting

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Regulation and frequency management aspects of the digital radio in Hungary

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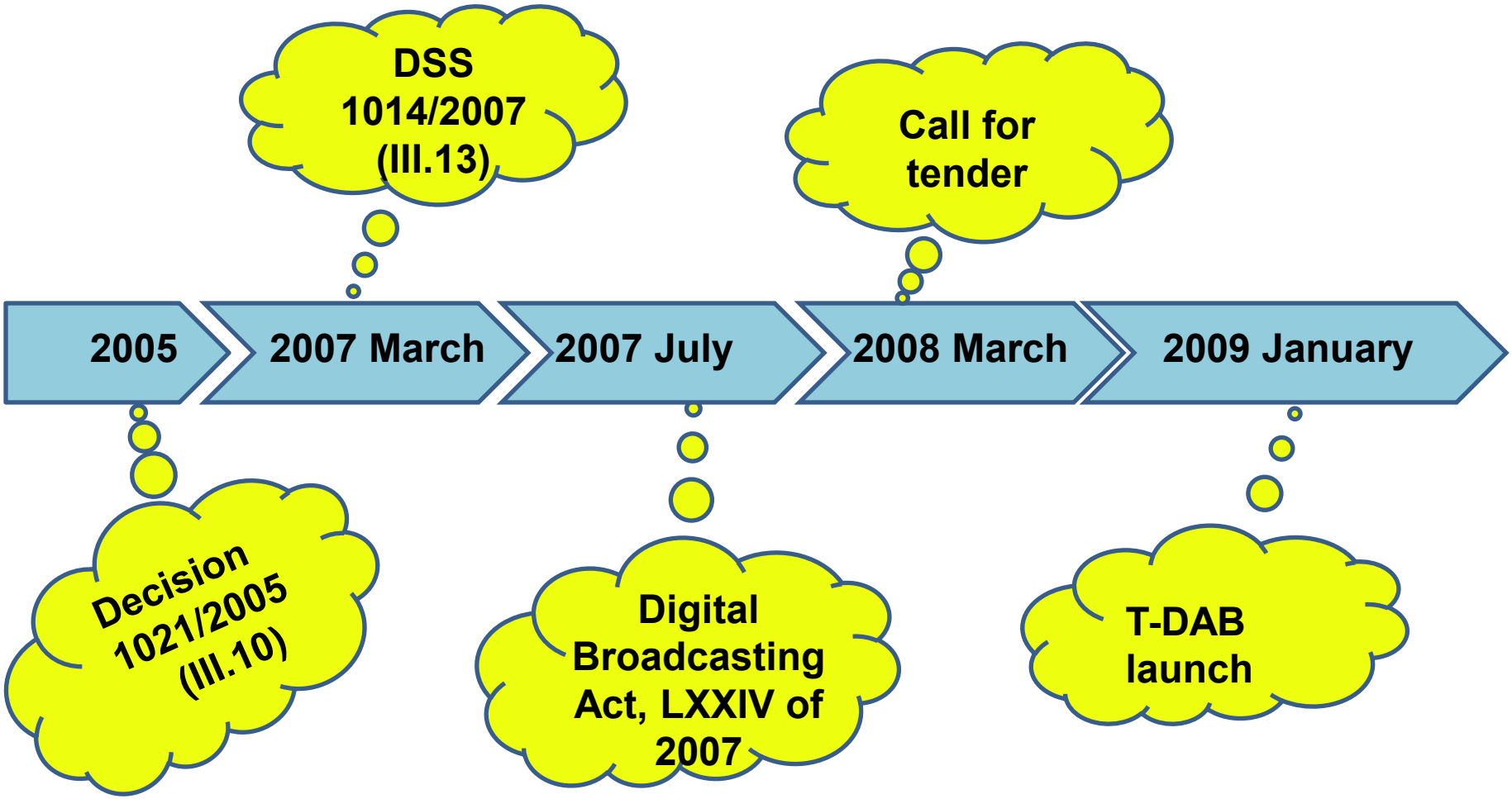
Introduction

- Legal background to launch digital radio
- Tender for rights to operate one T-DAB multiplex in Hungary
- Launch of test transmission of the digital radio
- Status quo of the radio in Hungary
- Intentions of the Hungarian regulator
- The most important conclusions of the study on digital radio
- Results of the poll

Legal background to launch digital radio



Legal background to launch digital radio

Digital Broadcasting Act, 2007

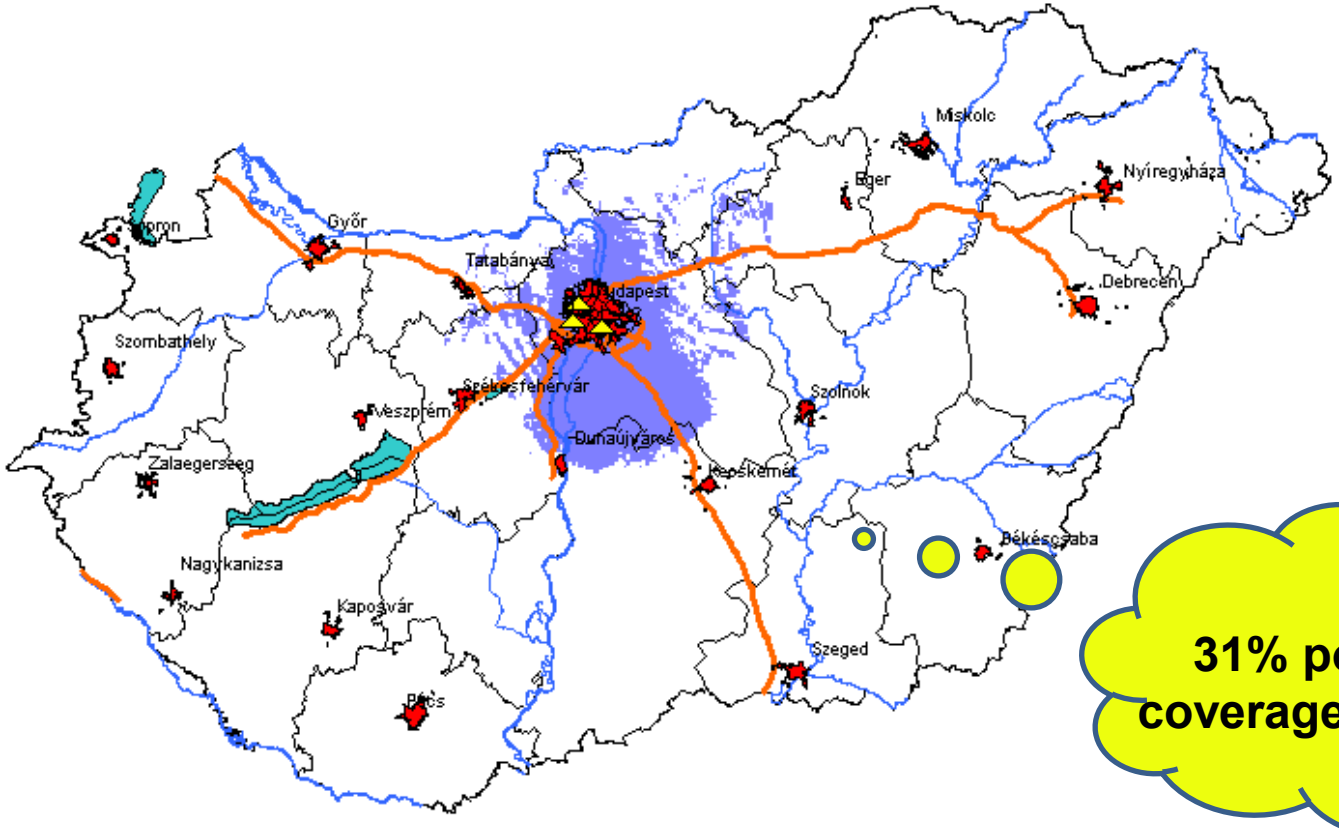
- Regulation of broadcasting;
- More detailed regulation is needed on local radio
- More detailed regulation is needed on ASO
- Planned ASO date: 2014
- The operation right of digital radio multiplex should be awarded through tender;
- Elements of the call for tender are compulsory
- Supervisor is a parliamentary ad hoc committee
- Regulator is responsible for the technical, administrative and professional aspects

Tender for rights to operate one T-DAB multiplex in Hungary

- Had to publish the tender by the end of year 2008
- Strong multiplex operator model
- More favourable public access than 94%
- Minimum criteria for roll out: quicker implementation for extra points
- The public broadcasters are under the rules of must carry
- Must carry rule was not for the two commercial broadcasters being on nationwide analogue terrestrial network
- Commitment relating to the maximum broadcasting fee of public services
- The tender intended to encourage
  - broadcasting regional programmes
  - choosing latest DAB+ technology.
  - providing supplemental digital services

Launch of test transmission of the digital radio

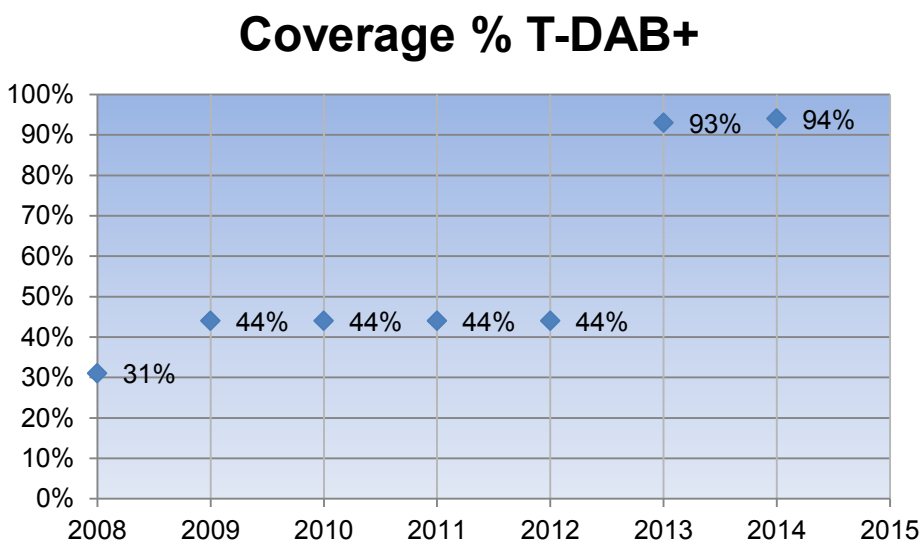
- **Licence is granted until 5th September 2020**
- **Three transmitters**



31% population coverage since 2009

Launch of test transmission of the digital radio

- No contract with any of the radio broadcasters for digital service
- Test transmission was continued
- Network deployment was stopped
- Original schedule:



- Revision of the contract in 2011
- Interim deadlines are not defined

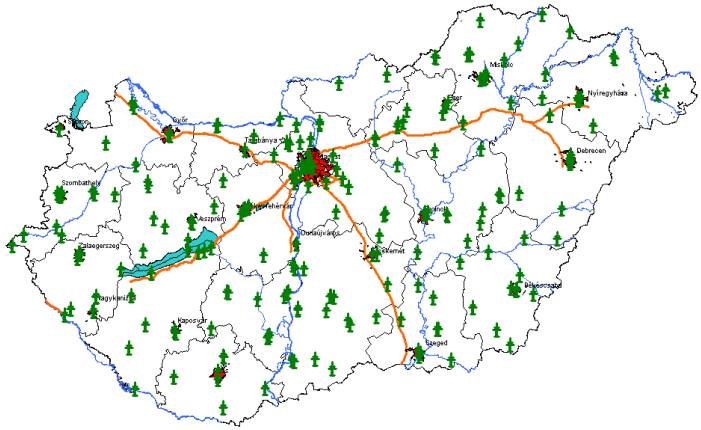
94% population coverage until end of 2014

Status quo of the radio in Hungary

- VHF band was used for TV broadcasting till 2013 (ASO)
- One commercial nationwide radio broadcaster finished the operation in 2012
- Four nationwide public radio programmes

KOSSUTH RÁDIÓ · PETŐFI RÁDIÓ · BARTÓK RÁDIÓ · DANKÓ RÁDIÓ

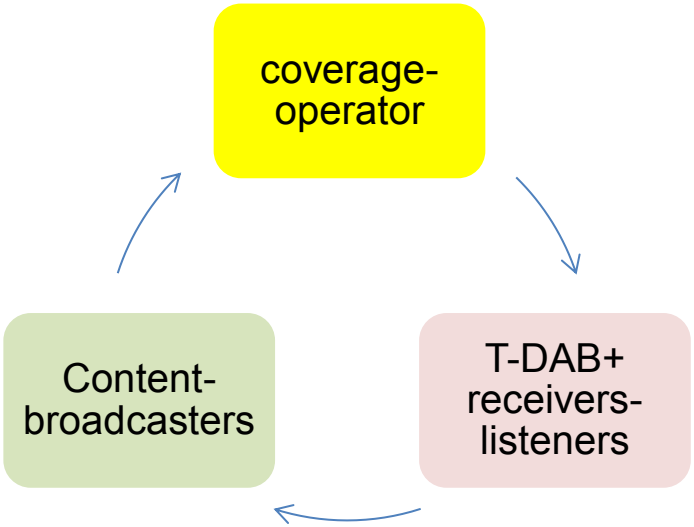
- One nationwide commercial radio program Class FM
- Two hundred regional or local radio transmitters



- No frequency to new nationwide FM ra
- Less than 1000 DAB+ receivers in Hungary

Status quo of the radio in Hungary – Chicken or the eggs dilemma

- **Hungary is the first country among CEE countries announcing T-DAB tender**
- **Successful tender for digital radio: in 2008**
- **Winner: Antenna Hungária**
- **Right to operate one T-DAB multiplex: until 5th September 2020**
- **Mobile coverage: 31% of the population in the Bu**
- **Available programmes on the digital platform: 7**



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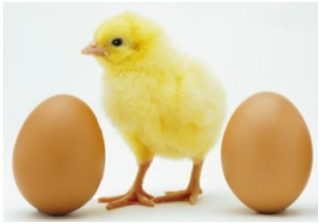


Intentions of the Hungarian regulator

Considering that

- **commitments for 94% population coverage by the end of**
- **licence for operating the T-DAB is valid only until 2020**
- **there are new tendencies at international level**

NMHH considers the necessity to analyse the situation of the digital radio and take measures regarding the future of T-DAB in Hungary

- **study on digital radio**
- **Hungarian listenership survey data**

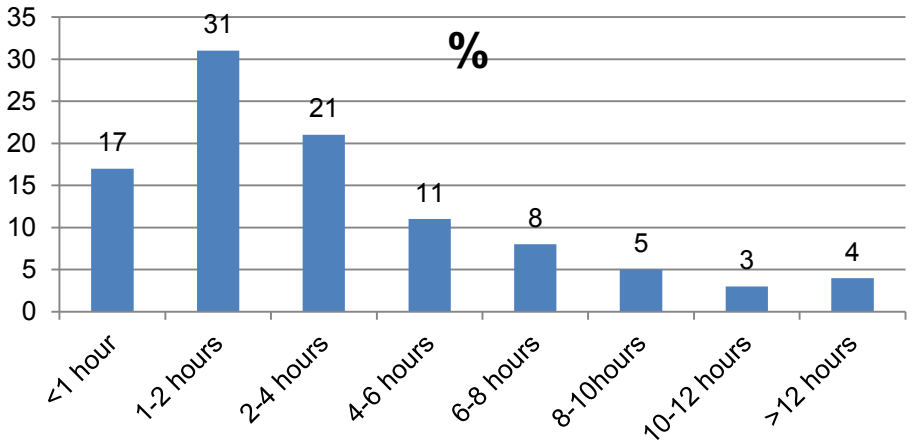
The most important conclusions of the study on digital radio

The key elements of successful transition from analogue to digital :

- **committed intent towards the digital radio technology from the state-side.**
- **highlighted role of the public media during the introduction of digital radio**
- **providing new content on the digital platform**
- **communicated medium and long-term strategy**
- **continuous and conscious communication towards the radio listeners**

Results of the poll

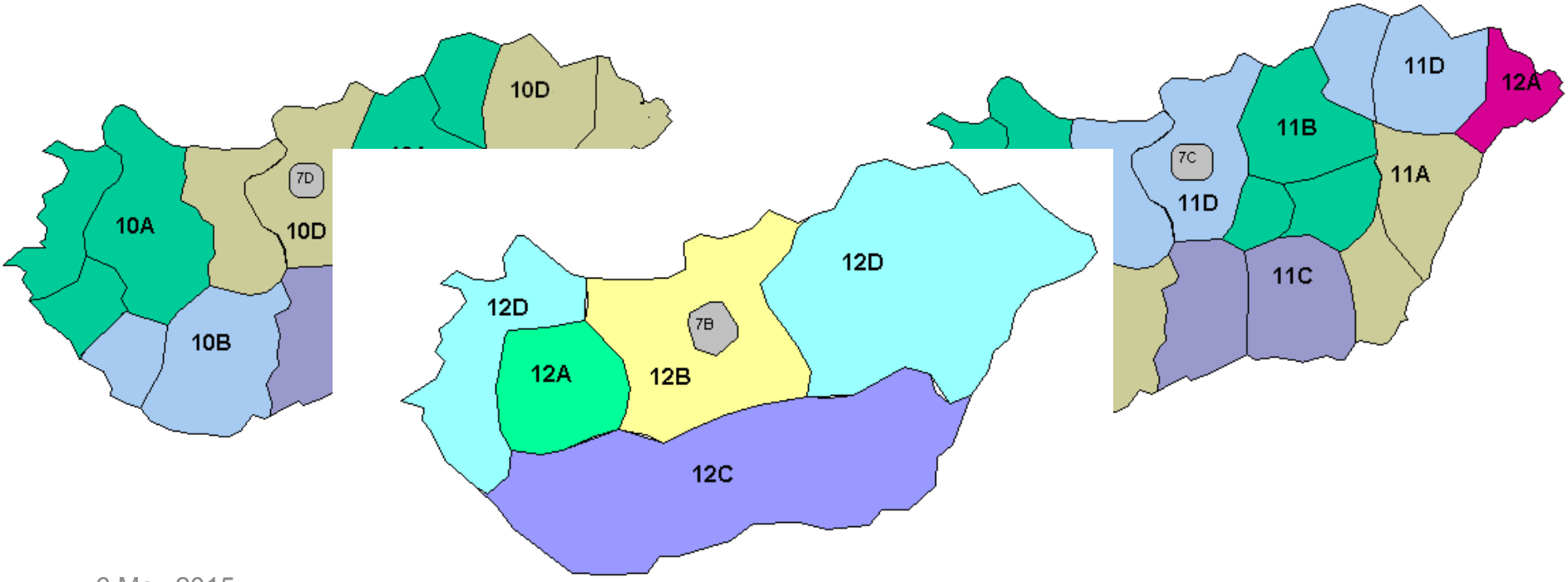
- **Listening to the radio is quite high in Hungary**



- **65% of the adult population listen to radio on a daily basis**
- **The primary venue is the home and in the car**
- **Loyalty to the favourite radio station**
- **Listening to music and news programmes is significant**
- **Satisfaction with the number and variety of programmes**
- **Tolerance towards radio advertisements**

Regional Radiotelecommunication Conference 2006

- Part of the Band 174-230 MHz is allocated to digital radio
- The GE06 Plan – similarly to other countries - contains frequencies to three nationwide digital radio networks for Hungary
- The GE06 Plan contains only allotments in case of T-DAB
- The reference planning configuration is portable indoor (RPC 5)



Current situation in Hungary

- **The blocks of channel 12 were tendered to the one multiplex in 2008**
- **Until 2013, there was an operating high tower high power analogue television transmitter on channel 12 on Kab-hegy (about 100 km from Budapest)**
- **Due to the reason before, the test transmission was started on channel 11D in 2009**

Network optimization

- **The reasons for the tendering the blocks channel 12 in 2008:**
  - **Lower number of probably affected operating analogue transmitters in the neighbouring countries**
  - **Higher probability of successful coordination for the transition period**

Launch of the Hungarian T-DAB+ service is delayed until after 17 June 2015

Analogue television transmitters have no effect on the implementation of T-DAB network.

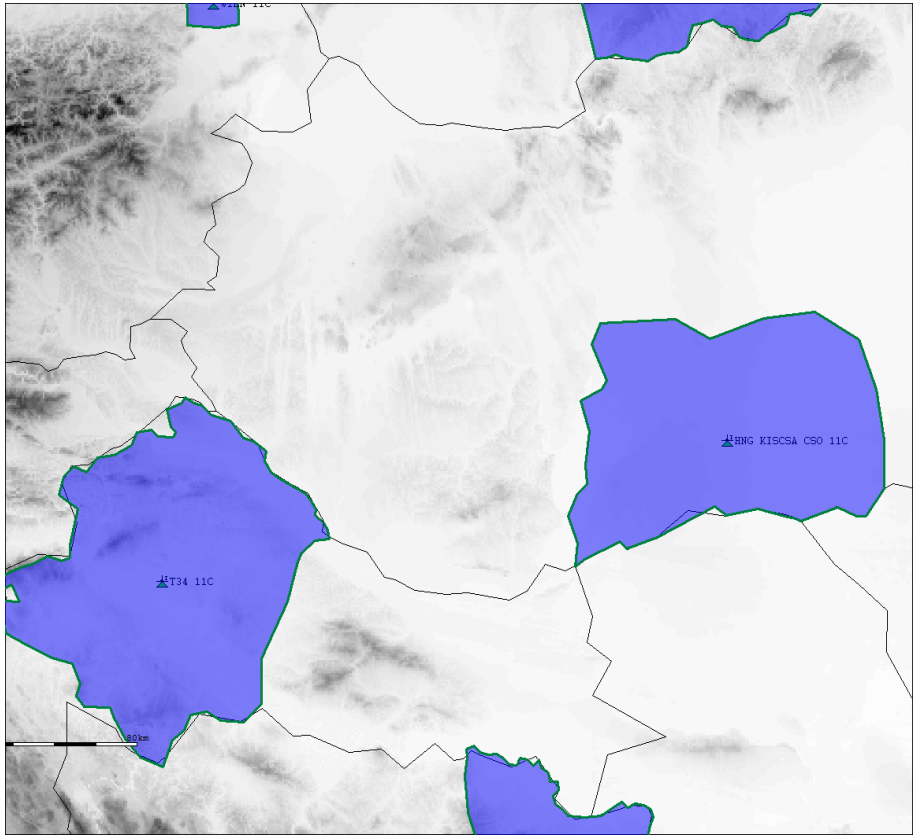
Optimal structure of the T-DAB networks have been investigated

Network optimization
Study cases

- **Intial state: Transmitter parameters derived from allotment conversion with RPC 5**
- **The effect of the gradual power increase has been investigated**
- **The coverage (portable indoor) and the caused interference have been examined**
- **The results are very different in different blocks**
- **Factors affecting:**
  - **Re-use distance of the co-channel allotments**
  - **Geographical and radiation conditions of the transmitter (asl, transmitter height, ERP, antenna pattern)**
  - **Topography**

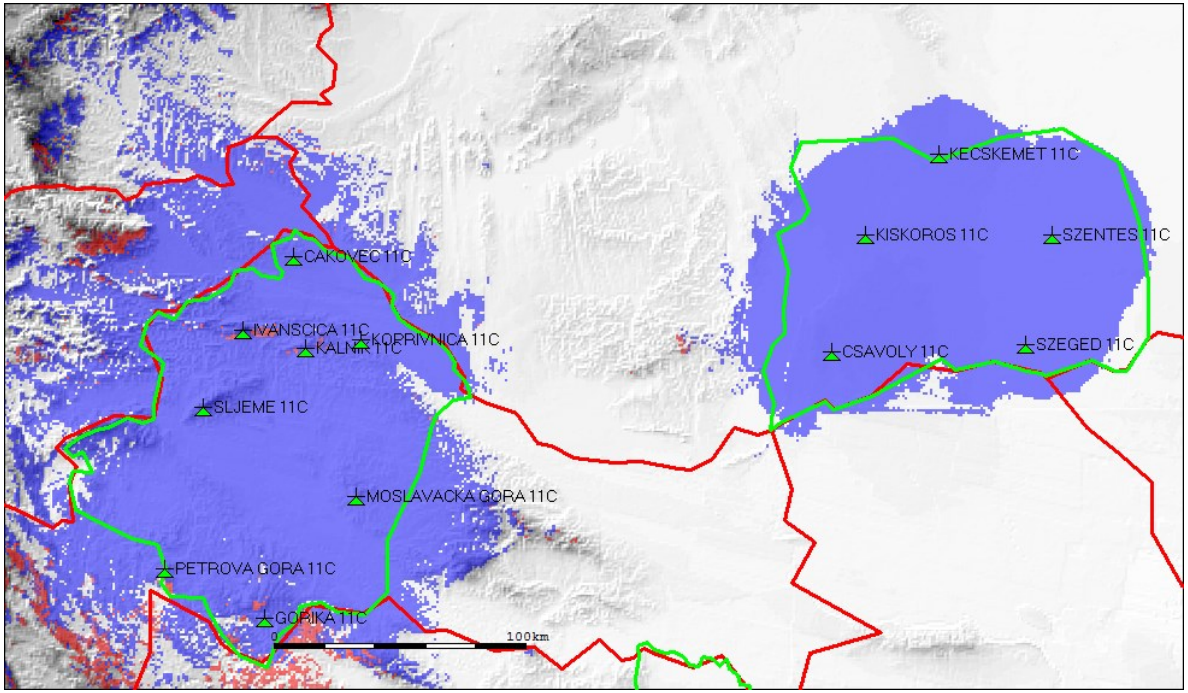
Network optimization
Study case 1 (less critical)

- **Channel: 11C**



Network optimization
Study case 1 (less critical)

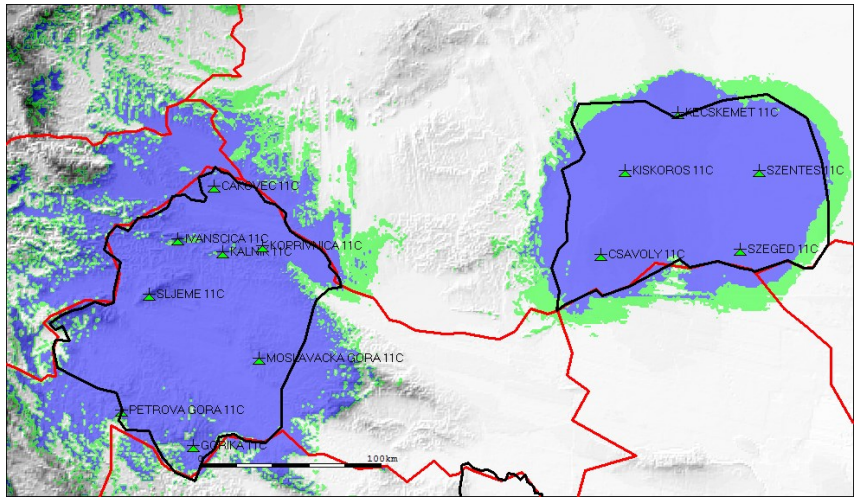
- **Result with conform parameters:**
  - **There is no mutual interference**
  - **Uncovered areas in the allotment are caused by the topography and or relative low ERPs**



Network optimization
CASE 1 (less critical)

- **Result with increased ERPs:**
  - **ERP increased by 5-10 dB in both countries compared to the conform parameters**
  - **There is no mutual interference**

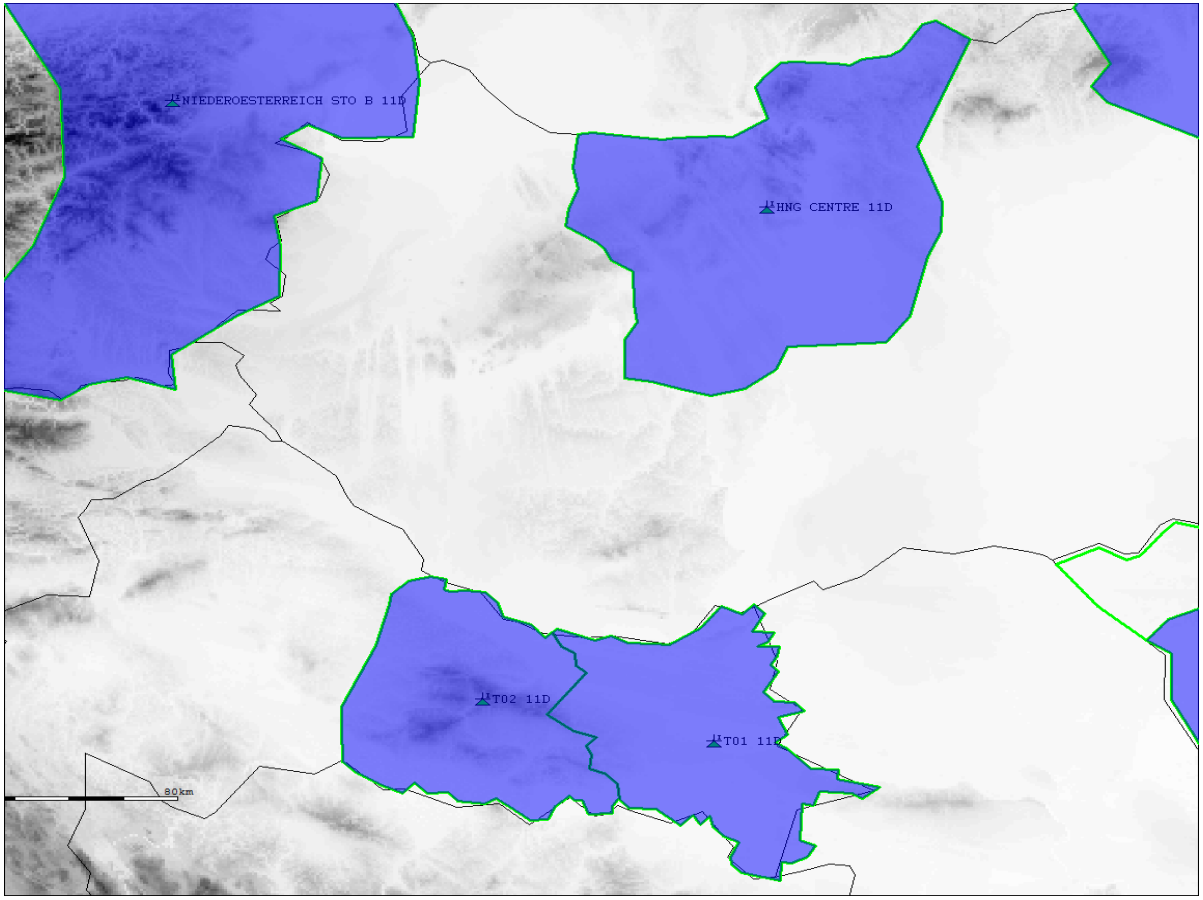
Coverage increased



Optimal solution seems to be the increase of ERPs

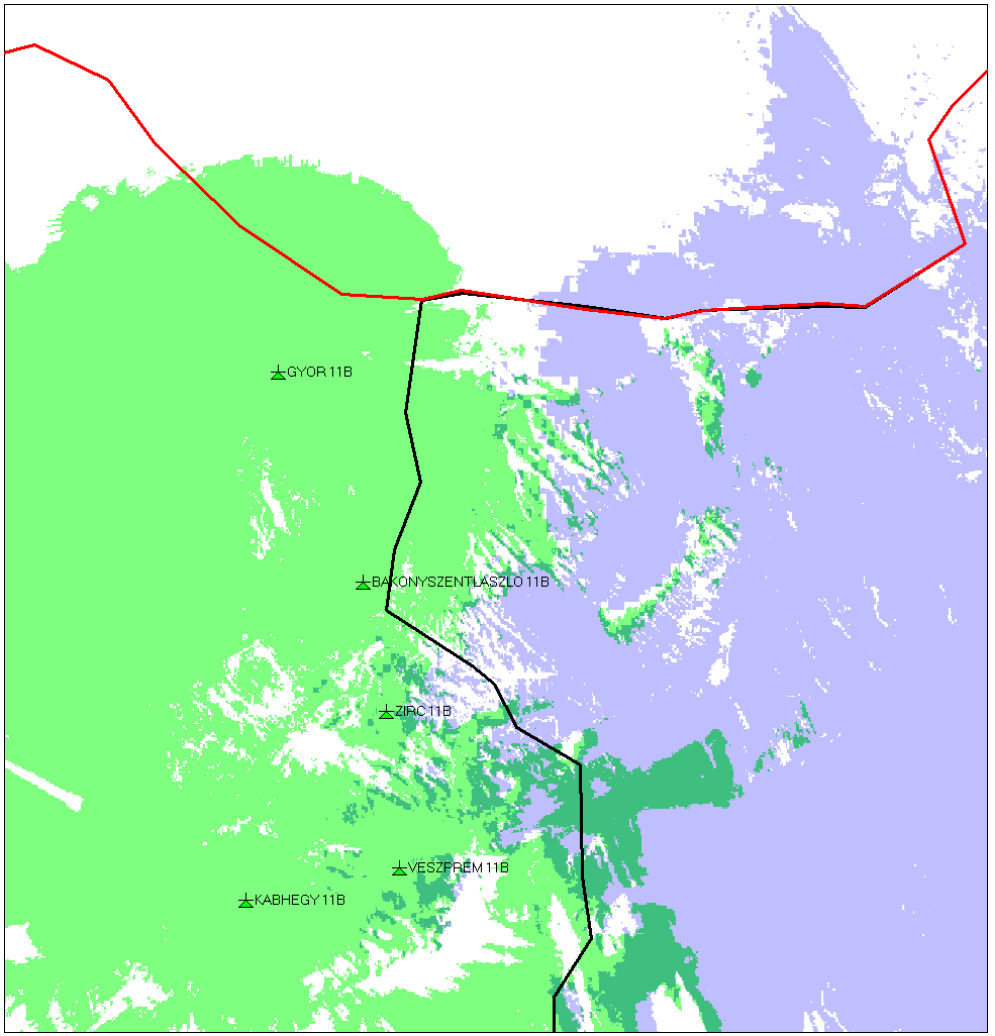
Network optimization
Study case 2 (more critical)

- **Channel: 11D and 12C**



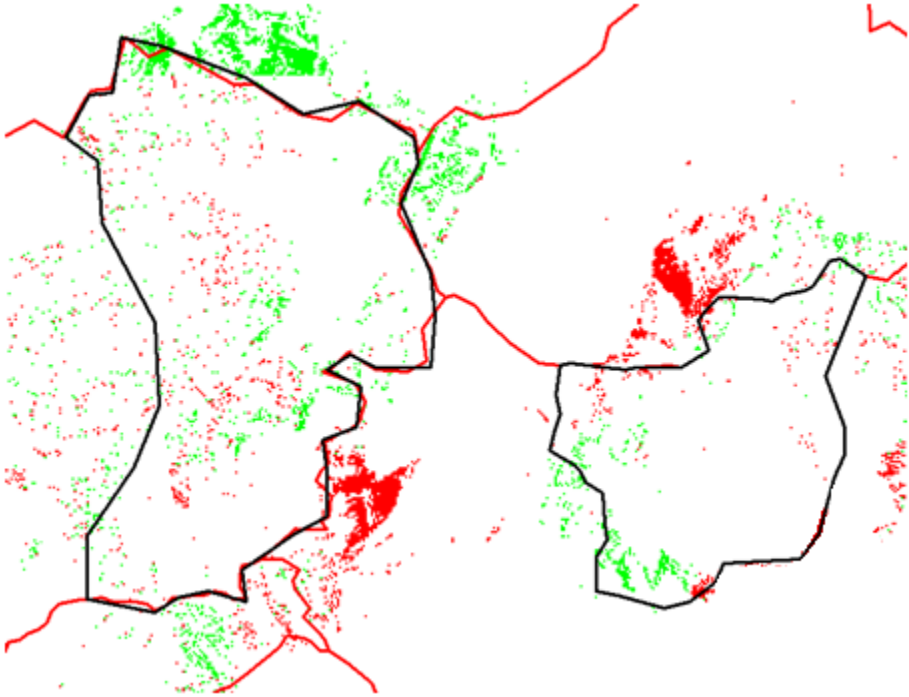
Network optimization
CASE 2 (more critical)

- **Conform parameters in both countries**
- **There are interfered areas inside the allotments:**
  - **Yellow:** interference caused by AUT transmitters
  - **Green:** interference caused by HNG transmitters
- **Transmitters of the neighbouring allotment would ensure coverage on the part of the interfered area of the Hungarian allotment**



Network optimization
Study case 2 (more critical)

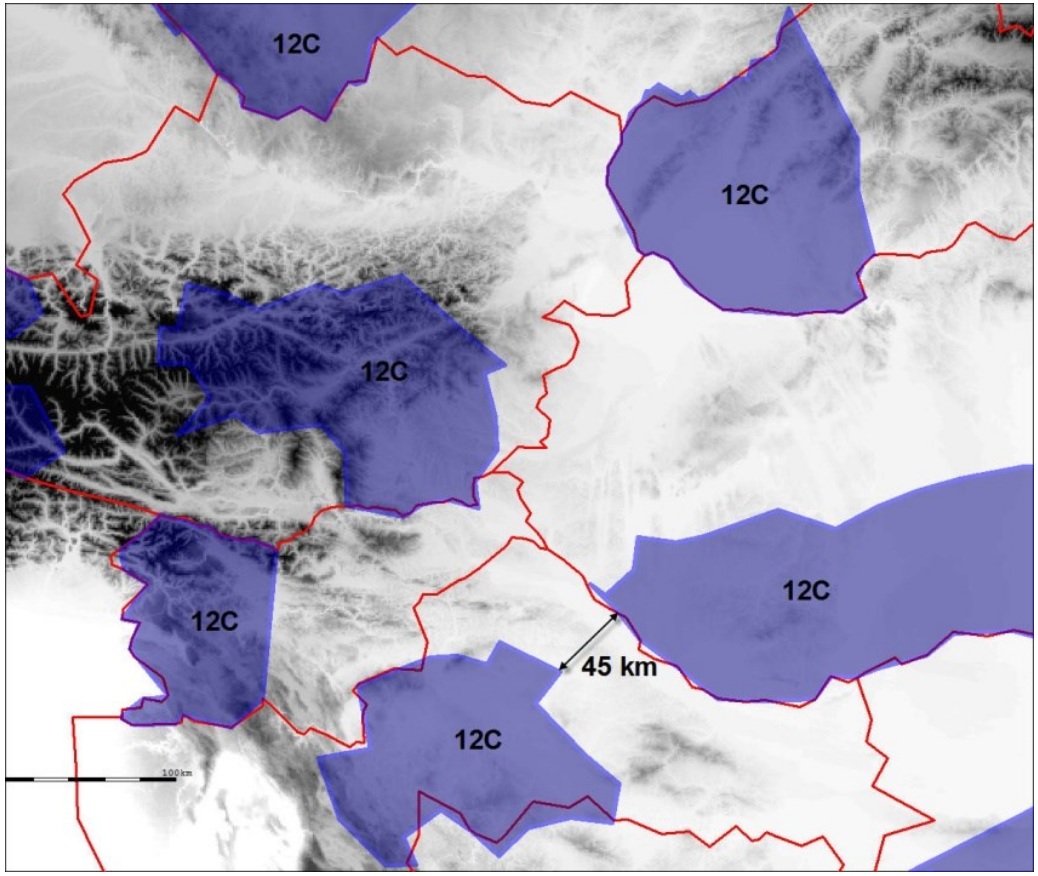
- **Result with increased ERPs by 5 dB:**
  - **The coverage has been increased in the red areas due to the higher ERPs**
  - **The coverage has been decreased in the green areas due to the higher interference**



Optimal solution seems to be the usage of conform parameters

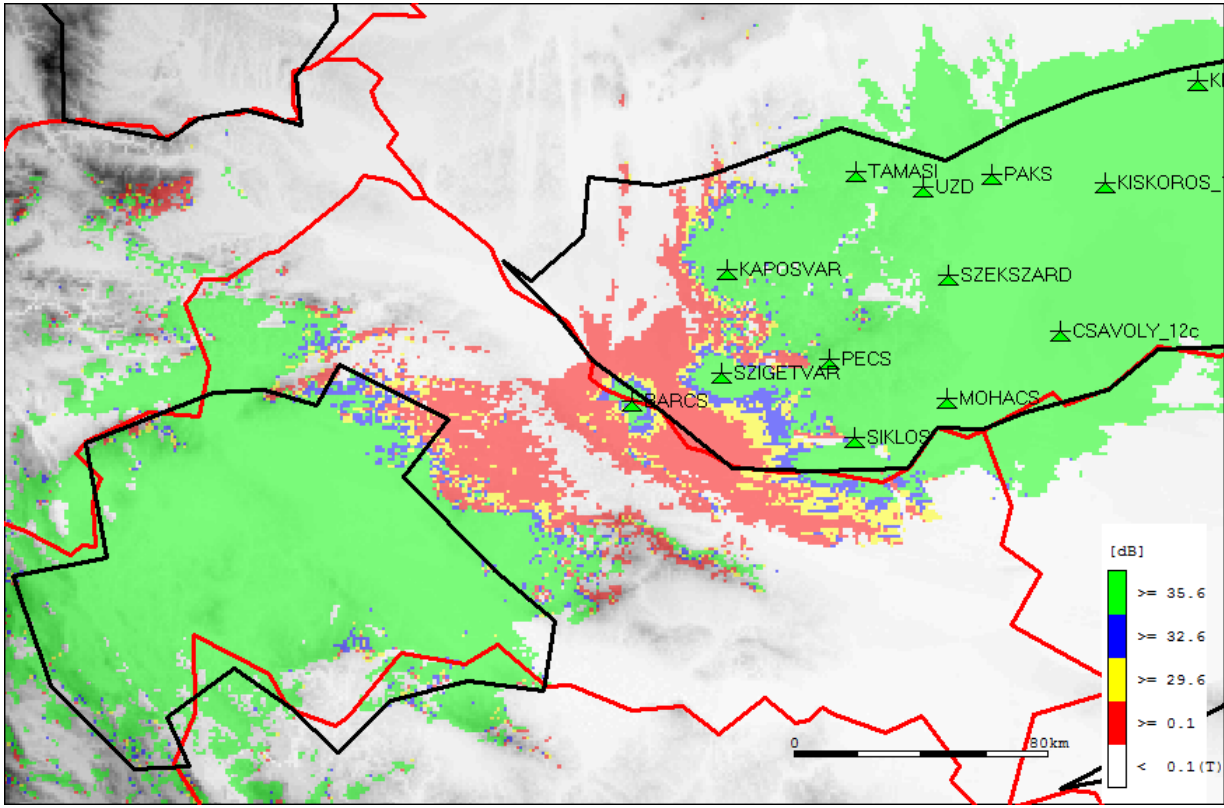
Network optimization
Study case 3 (most critical)

- **Channel: 12C**



Network optimization
Study case 3 (most critical)

- **Conform parameters in both countries**
- **The transmitters cause high interference to each other (red colour) due to the short re-use distance (45 km)**



Increasing ERPs worsen the situation.

Transmitters of the neighbouring allotments would NOT ensure coverage

Possible solution is the modification of the implementation (e.g. Usage of another transmitter sites and/or more directed antenna systems)

Conclusion

- **The players of the terrestrial digital radio - working on a commercial basis – have not been able to penetrate the digital radio**
- **Changing the broadcasting technology from one day to the other one is impossible even though the digital radio have significant economic benefits**
- **Key elements of a successful transition – among others - are the committed intent towards the digital radio technology from the state-side, new programs , medium and long-term strategy, communication towards the radio listeners**
- **The implementation of T-DAB allotment plans have some technical challenges due to the short frequency re-use distance and different topography**
- **The appropriate network optimization strategy varies from block to block, nevertheless it can be classified in the three groups introduced before.**

Thank you for your attention

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