Digitalna dividenda u BiH

PosTel 2010 - XXVIII Simpozijum o novim tehnologijama u poštanskom i telekomunikacionom saobraćaju
Beograd, 14. i 15. decembar 2010

Senad Namgalija

snamgalija@rak.ba
http://www.rak.ba

Regulatorna agencija za komunikacije

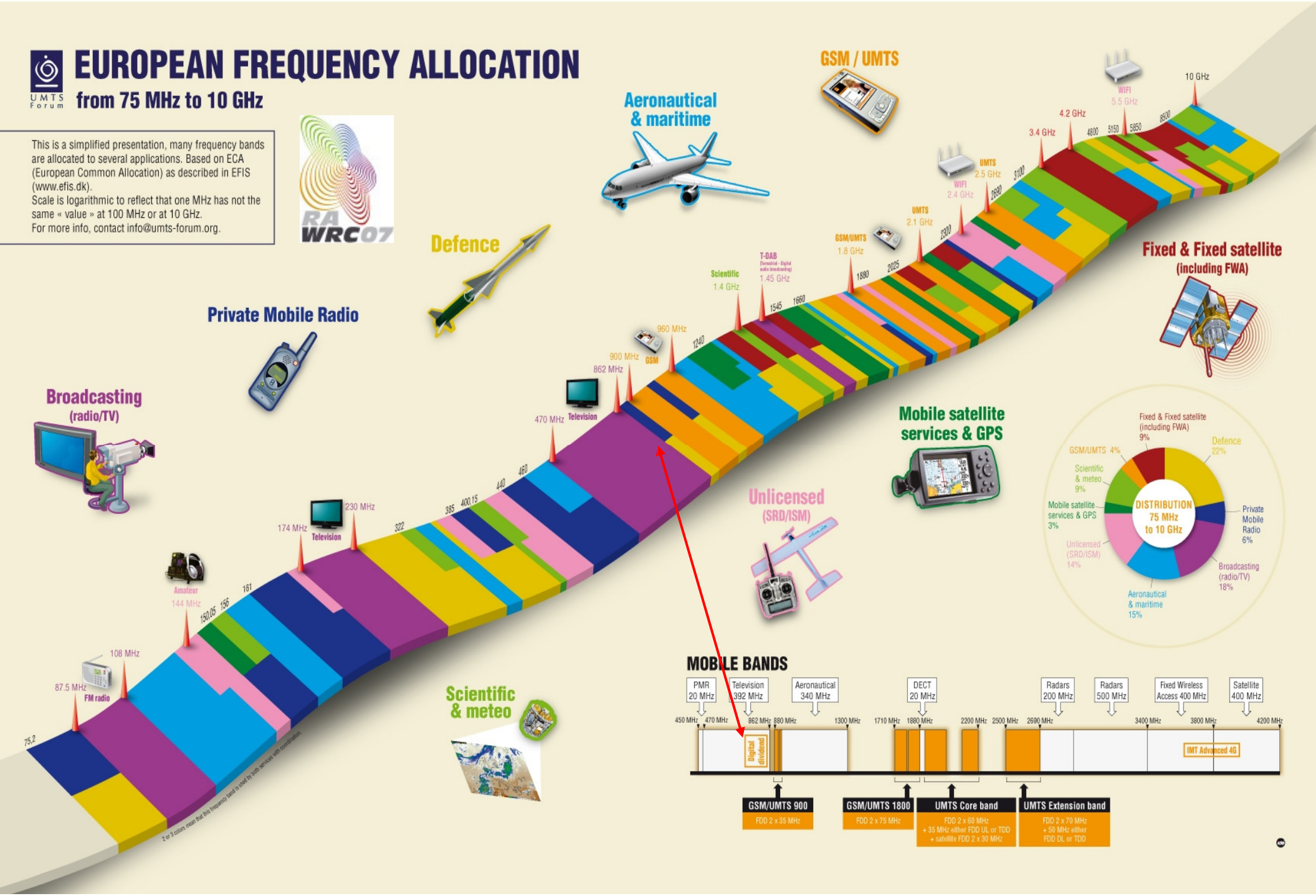
EUROPEAN FREQUENCY ALLOCATION

from 75 MHz to 10 GHz

UMTS Forum

This is a simplified presentation, many frequency bands are allocated to several applications. Based on ECA (European Common Allocation) as described in EFIS (www.efis.dk).
Scale is logarithmic to reflect that one MHz has not the same « value » at 100 MHz or at 10 GHz.
For more info, contact info@umts-forum.org.

RA WRC07



Zemaljska radiodifuzija

- Kao jedina FTA (Free-To-Air) platforma, predstavlja osnovni način za prijem RTV sadržaja,
- Mogućnosti velikih zona pokrivanja - najeftiniji način isporuke RTV sadržaja,
- Rasprostranjena prijemna oprema - teško je zamijeniti drugim platformama,
- Nudi i uslugu univerzalnog servisa RTV programa.

Veliki značaj za društvo u cjelini.

DTT forum – DTT strategija

DTT FORUM
BOSNA I HERCEGOVINA

STRATEGIJA

PRELASKA S ANALOGNE NA DIGITALNU ZEMALJSKU RADIODIFUZIJU U FREKVENCIJSKIM OPSEZIMA 174-230 MHz i 470-862 MHz U BOSNI I HERCEGOVINI

Vijeće ministara Bosne i Hercegovine je na 91. sjednici, održanoj 17.06.2009. godine, usvojilo Strategiju prelaska s analogne na digitalnu zemaljsku radiodifuziju u Bosni i Hercegovini.

DVB T TERRESTRIAL

DTT strategija - zaključci

1. U Bosni i Hercegovini će se najkasnije 01. 12. 2011. godine u potpunosti ugasiti analogna radiodifuzija u UHF opsegu;
2. U uvođenju digitalne zemaljske televizije u Bosni i Hercegovini će se koristiti DVB-T standard sa MPEG-4 (H.264/AVC) sistemom kompresije;
3. Tranzicijski period prelaska na digitalnu zemaljsku radiodifuziju treba biti što kraći;
4. Proces uvođenja digitalne zemaljske radiodifuzije treba se odvijati po fazama (koje prate jedna drugu i koje međusobno zavise);
5. Sprovesti javnu informativnu kampanje informiranja i educiranja bh. javnosti o procesu uvođenje digitalne zemaljske (terestrijalne) radiodifuzije, predstavljanja prednosti digitalne televizije, te koraka koji se od građana očekuju u osposobljavanju domaćinstava za prijem digitalnog TV signala u skladu sa zadatim rokovima;
6. Sprovesti subvencioniranje stanovništva prilikom kupovine DVB-T prijemnika. Subvencije će znatno ubrzati proces prelaska na DTT, jer je to efikasan način da se građani potaknu na što bržu kupovinu ovih uređaja. Na ovaj način će se pratiti i penetracija prijemnika na tržištu, što će omogućiti TV stanicama da se prije odluče na digitalizaciju svog programa i pristup multipleksu.

DTT (Digital Terrestrial Television) - prednosti

Osim signala SDTV (Standard-definition television) i teletext-a koji nudi analogna, digitalna TV omogućava:

- Bolje tehničke karakteristike,
- Dodatni kanali (nacionalni, regionalni, lokalni)...

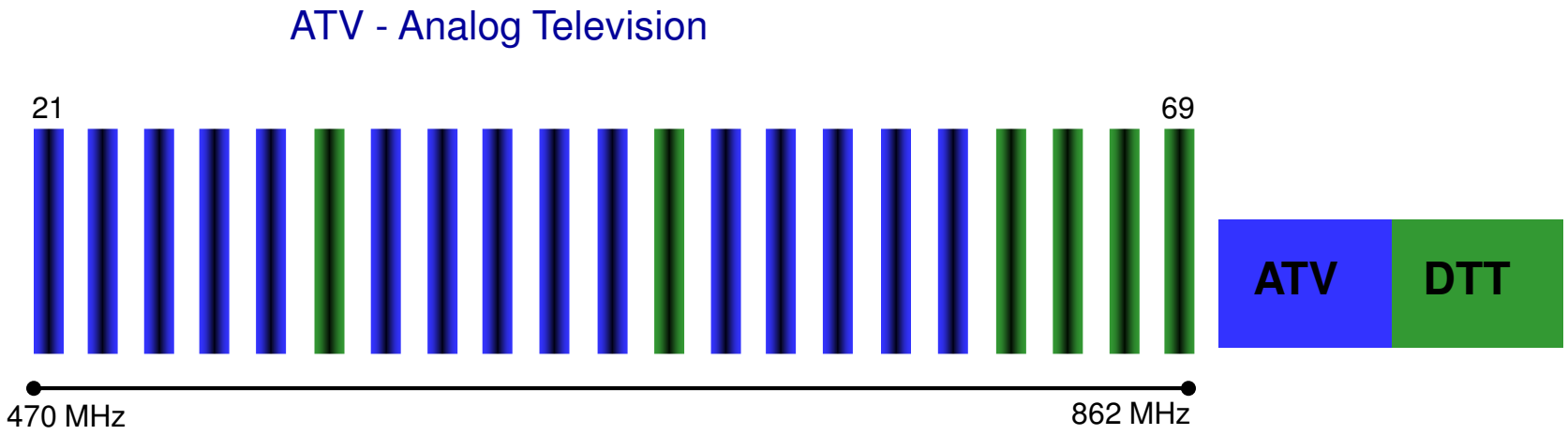
Digitalna TV pruža i nove mogućnosti:

- EPG (Electronic program guides),
- HDTV (High-definition television),
- mobilne TV,
- 3DTV,
- VoD (Video on Demand),
- prijenos podataka...

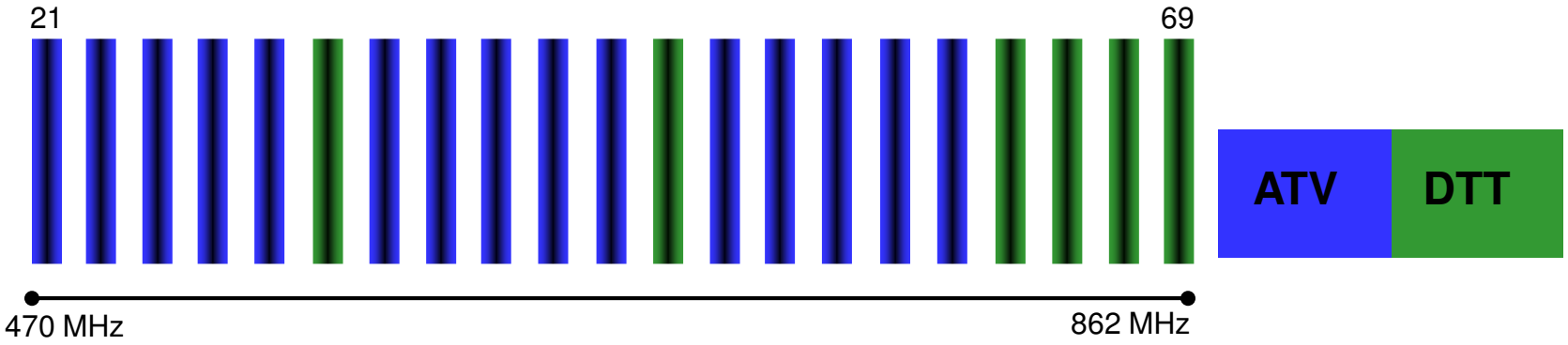
Značajno je napomenuti:

- Smanjenje troškova,
- Mogućnost za dalji razvoj i inovacije...

RF spektar, UHF opseg – uvođenje DTT



UHF opseg – ASO (Analogue Switch-off)



STRATEGIJA

PRELASKA S ANALOGNE NA DIGITALNU ZEMALJSKU RADIODIFUZIJU U BiH

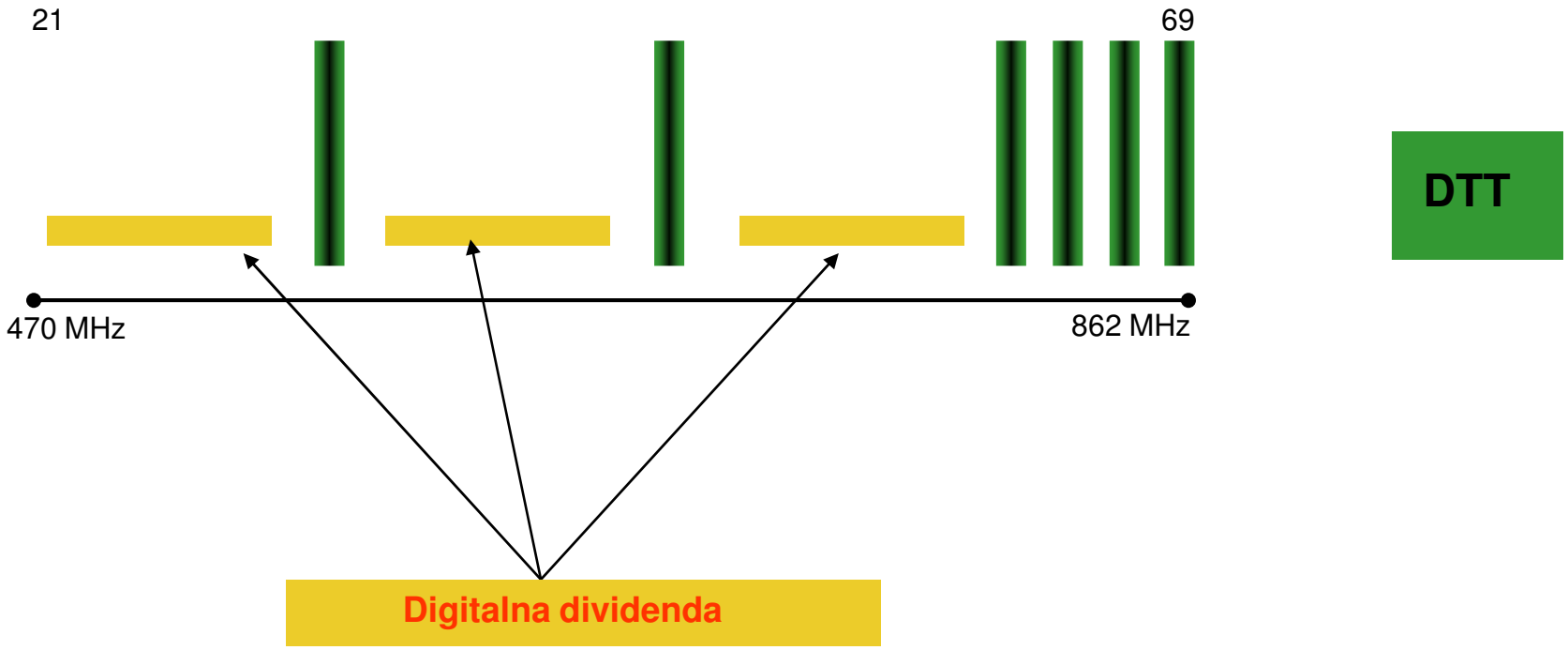
C. VREMENSKI OKVIR

Dana **01.12.2011**. godine u 00.01 sati, analogna radiodifuziju u cijeloj Bosni i Hercegovini prestaje sa radom u opsegu IV (470-582 MHz - kanali 21-34) i V (582-862 MHz - kanali 35-69)

Prelazak na DTT u regiji

Region	Datum gašenja analogne TV
Slovenija	01.12.2010.
Hrvatska	31.12.2010.
Bosna i Hercegovina	01.12.2011.
Srbija	04.04.2012.
Crna Gora	31.12.2012.
Makedonija	2012.
Albanija	2012.

UHF opseg - samo DTT



DTT strategija – Digitalna dividenda

DTT FORUM
BOSNA I HERCEGOVINA

STRATEGIJA

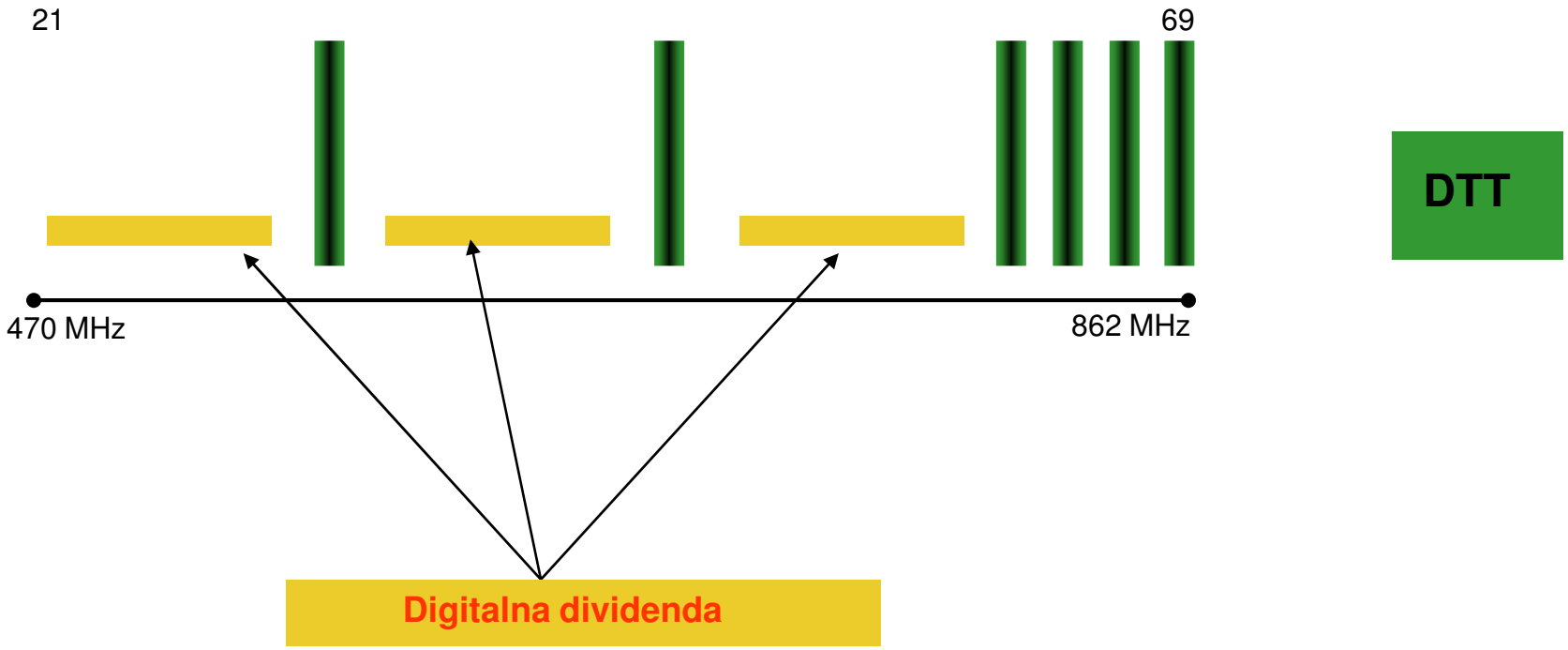
PRELASKA S ANALOGNE NA DIGITALNU ZEMALJSKU RADIODIFUZIJU U FREKVENCIJSKIM OPSEZIMA 174-230 MHz i 470-862 MHz U BOSNI I HERCEGOVINI

5. Digitalna dividenda

Prelaskom na digitalnu zemaljsku radiodifuziju doći će do oslobađanja značajnog dijela frekventnog spektra, što predstavlja posebnu korist za Bosnu i Hercegovinu. Nadležne institucije treba da odluče kako će upotrijebiti oslobođene frekvencije. Nakon gašenja analogne zemaljske radiodifuzije, oslobođene frekvencije mogu se koristiti za različite namjene, prvenstveno za uvođenje novih telekomunikacijskih servisa, kao i za uvođenje novih programskih sadržaja i povećanja zona pokrivenosti.

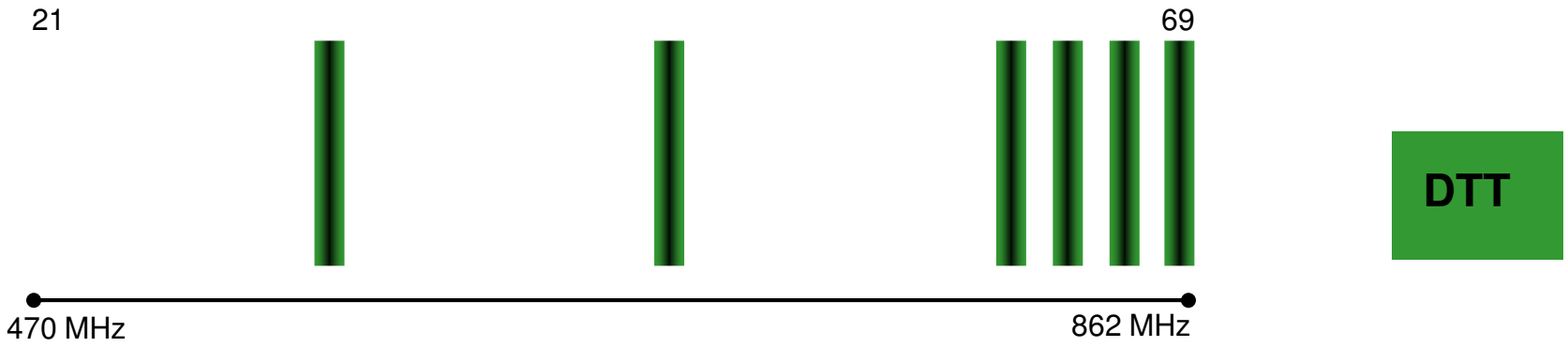
Korištenje oslobođenih frekvencija u najširem smislu predstavlja digitalnu dividendu. Digitalna dividenda za svaku državu predstavlja nov i značajan izvor prihoda.

UHF opseg - samo DTT

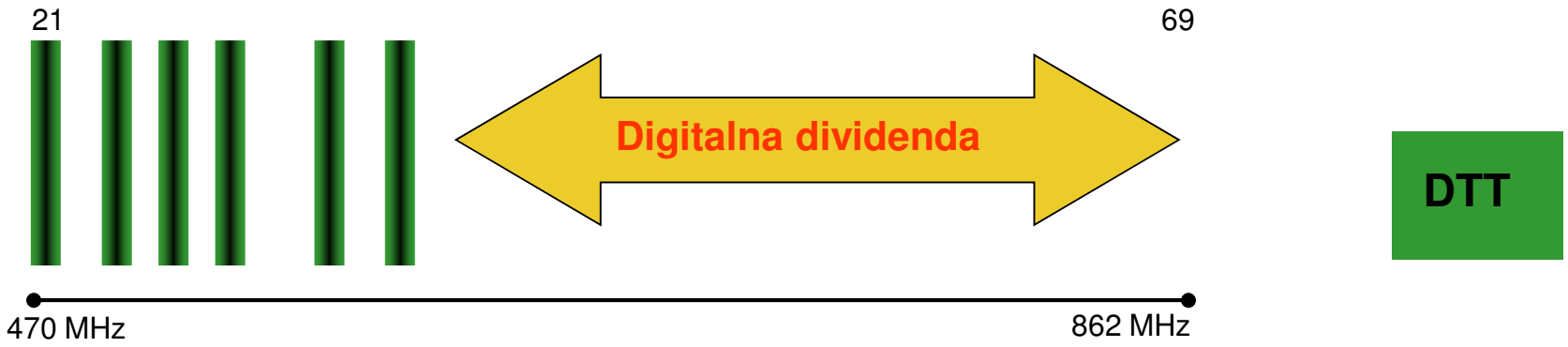


Fragmentirana digitalna dividenda se ne može koristiti za mobilne servise

UHF opseg – reorganizacija



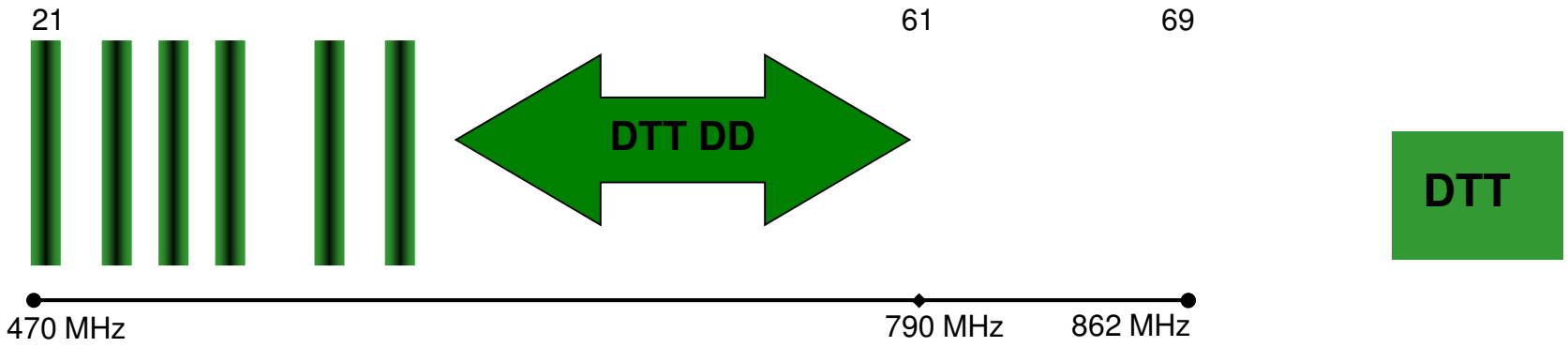
UHF opseg – Digitalna dividenda



Plan namjene i korištenje

Frekventni opseg	Namjena	Napomene	Korištenje	Propisi	Standardi
608 - 614 MHz					
	RADIODIFUZIJA Radioastronomija Mobilna 5.149 5.306		Radioastronomija Radiomikrofoni i pomoćni uređaji za slušanje SAP/SAB TV Radiodifuzija	 ERC/REC 70-03 GE06	 EN 300 422 EN 300 744 EN 302 297
614 - 790 MHz					
	RADIODIFUZIJA Mobilna 5.311A	EU13	Radiomikrofoni i pomoćni uređaji za slušanje SAP/SAB TV Radiodifuzija	ERC/REC 70-03 GE06	EN 300 422 EN 300 744 EN 302 297
780 - 876 MHz					
			Digitalni mobilni kopneni PMR/PAMR		EN 301 166
790 - 862 MHz					
	RADIODIFUZIJA MOBILNA osim mobilne vazduhoplovne 5.316 5.316B 5.317A	EU2 EU13	IMT Radiomikrofoni i pomoćni uređaji za slušanje SAP/SAB Sistemi odbrane TV Radiodifuzija	 ERC/REC 70-03 GE06	 EN 300 422 EN 300 744 EN 302 297

UHF opseg – 470-790 MHz

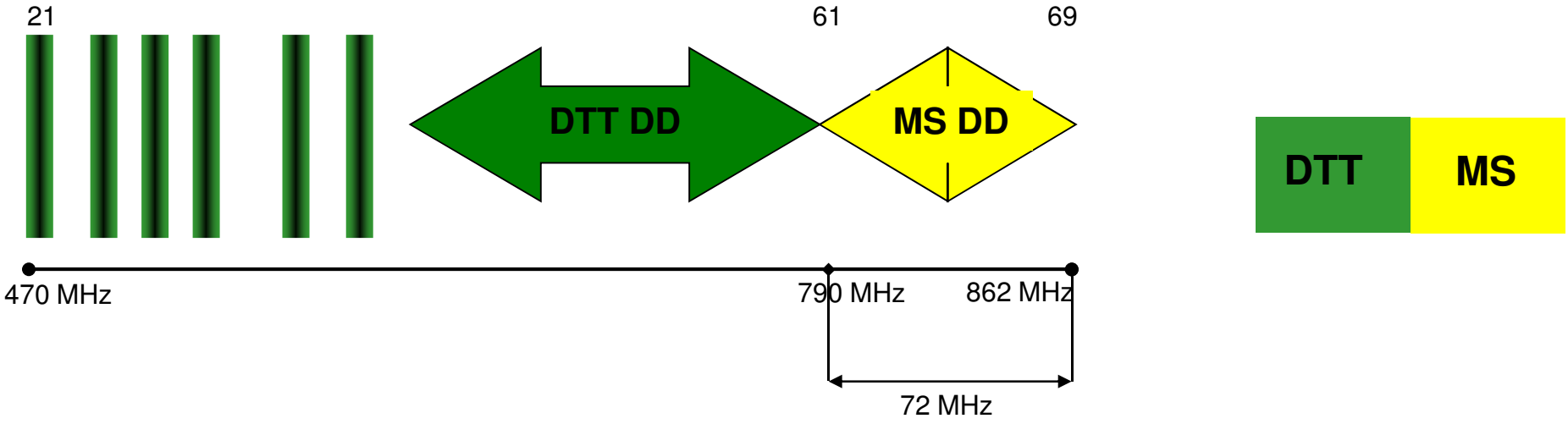


Spektar raspoloživ za:

- Dodatna pokrivanja (nacionalna, regionalna, lokalna)
- Nove usluge EPG,VoD,data
- Bolji prijem (fiksni prijem → portabl),
- Bolji kvalitet slike (SDTV→ HDTV),

UHF opseg je jedini koji omogućava dalji razvoj DTT.

UHF opseg – 800MHz



podopseg 790-862MHz
nije harmoniziran

Evropska Komisija

World Radiocommunication Conference
2007 (WRC-07)

Bringing all radio services together

(Geneva, Switzerland, 22 October-16 November 2007)

European Commission
Information Society and Media Directorate-General

Nakon WRC-07 u Ženevi,
kada je UHF opseg 790 - 862 MHz
u Evropi (Region 1) dodjeljen i mobilnim servisima na primarnoj osnovi,
EC je već u aprilu 2008. dala mandatu CEPT da razmotri
"mogućnost usklađivanja digitalne dividende u Europskoj uniji".

CEPT - ECC

CEPT ECC
Electronic Communications Committee

European Communications Office

General information | ECC Activities | Deliverables | Events | Topics/Projects | CEPT

Taking due account of the ECC work in response to the EC Mandates on Digital Dividend, the European Commission has adopted the following deliverables:

28 October 2009
European Commission Recommendation 2009/848/EC on "Facilitating the release of the digital dividend in the European Union"

6 May 2010
Commision Decision 2010/267/EU on harmonised technical conditions of use in teh 790-862 MHz frequency bands for terrestial systems capable of providing electronic communications services in the European Union.

ECC je pripremio više izvještaja koji se odnose na:

- oslobađanje digitalne dividende i
- usklađivanje tehničkih uslova za korištenja u opsegu 790-862 MHz.

UHF opseg – 800MHz

CEPT REPORT 30
Page 11

790-791	791-796	796-801	801-806	806-811	811-816	816-821	821 – 832	832-837	837-842	842-847	847-852	852-857	857-862
Guard band	Downlink						Duplex gap	Uplink					
1MHz	30 MHz (6 blocks of 5 MHz)						11 MHz	30 MHz (6 blocks of 5 MHz)					

Figure 2: Preferred harmonised channelling arrangement for the band 790-862 MHz

Nadležnosti administracija

Iako je politička odluka na nivou EU, implementacija je na nacionalnom nivou!

ECC REPORT 142

Electronic Communications Committee (ECC)
within the European Conference of Postal and Telecommunications Administrations (CEPT)

REARRANGEMENT ACTIVITIES FOR BROADCASTING SERVICES IN ORDER TO FREE THE SUB-BAND 790 - 862 MHz

Cork, February, 2010

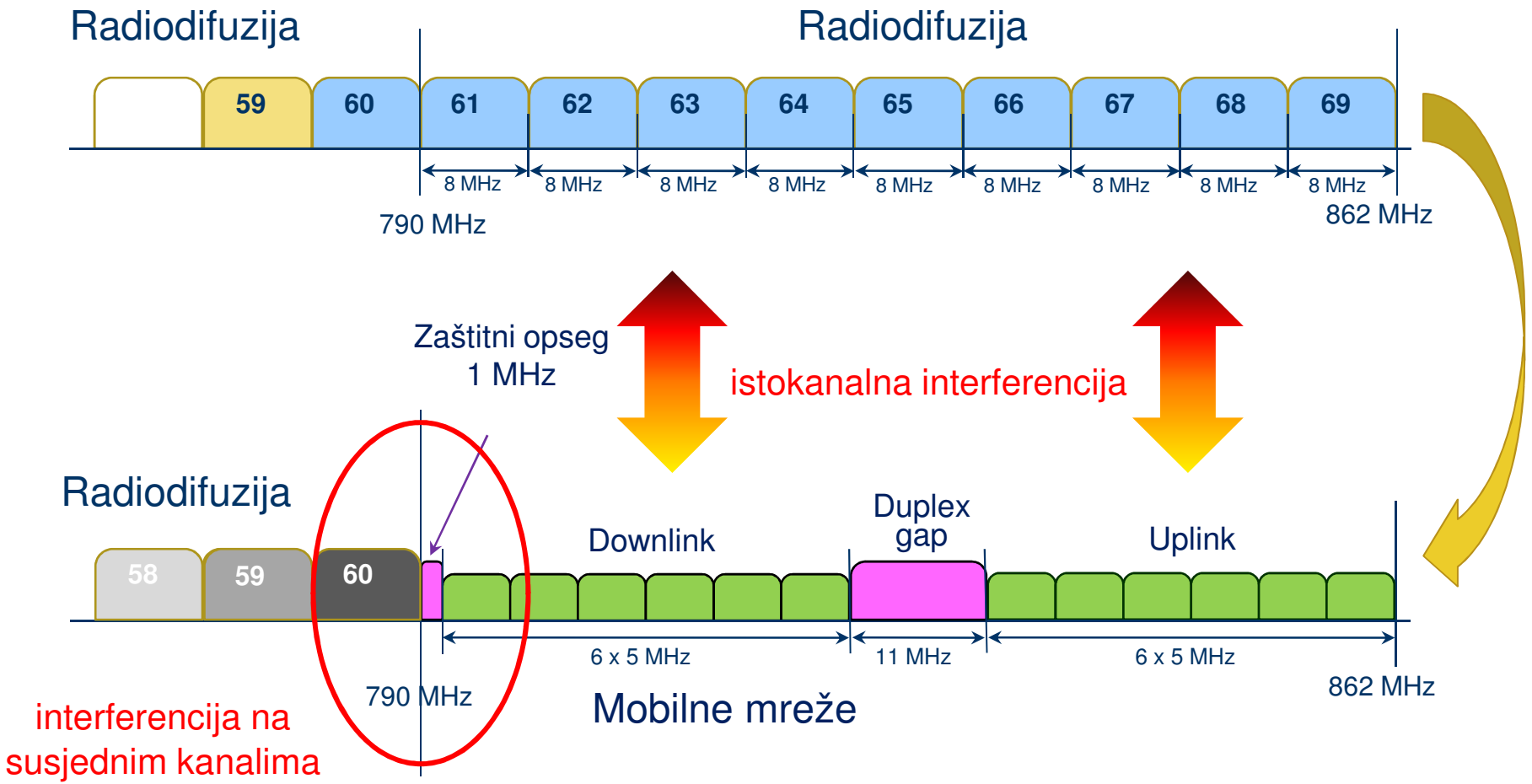
0 EXECUTIVE SUMMARY

This ECC Report provides information and advice for administrations covering the issues which need to be openly discussed and considered during an attempt to introduce mobile/fixed communications networks in the band 790 - 862 MHz or to use additional resources for broadcasting in the UHF band. These issues also may be considered by any administration which does not wish to make a change because in the event of a neighbour wishing to introduce mobile/fixed communications networks or to use additional resources for broadcasting, there will still be a need for discussions.

Neriješena pitanja:

- smetnje između mobilne mreže i DTT
- nadomještanje pokrivanja iz opsega 61-69,
- ...

Smetnje u opsegu 800 MHz



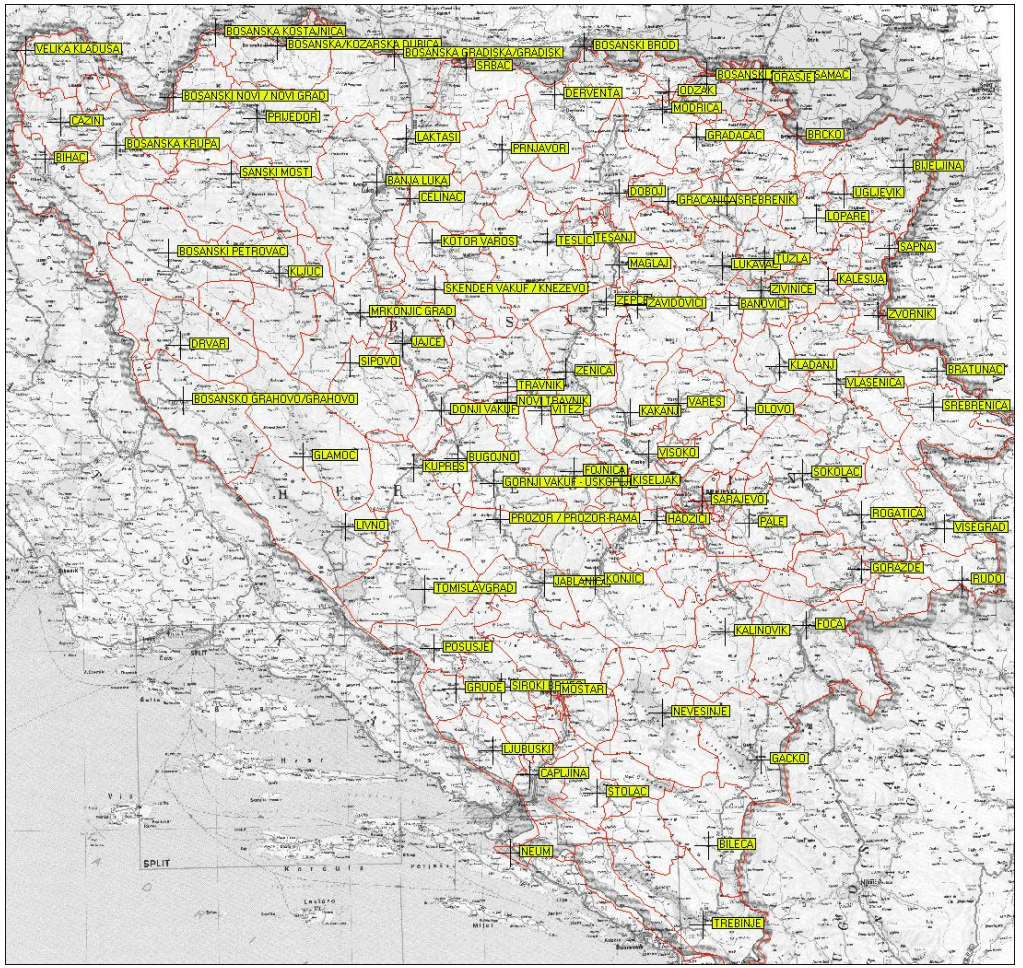
UHF opseg – BiH plan GE06D

Nacionalno pokrivanje:

9+1 Alotmenta, UHF - 7 pokrivanja

Lokalno pokrivanje:

Svaka općina, UHF - 2 pokrivanja



Nadomještanje pokrivanja iz opsega 61-69

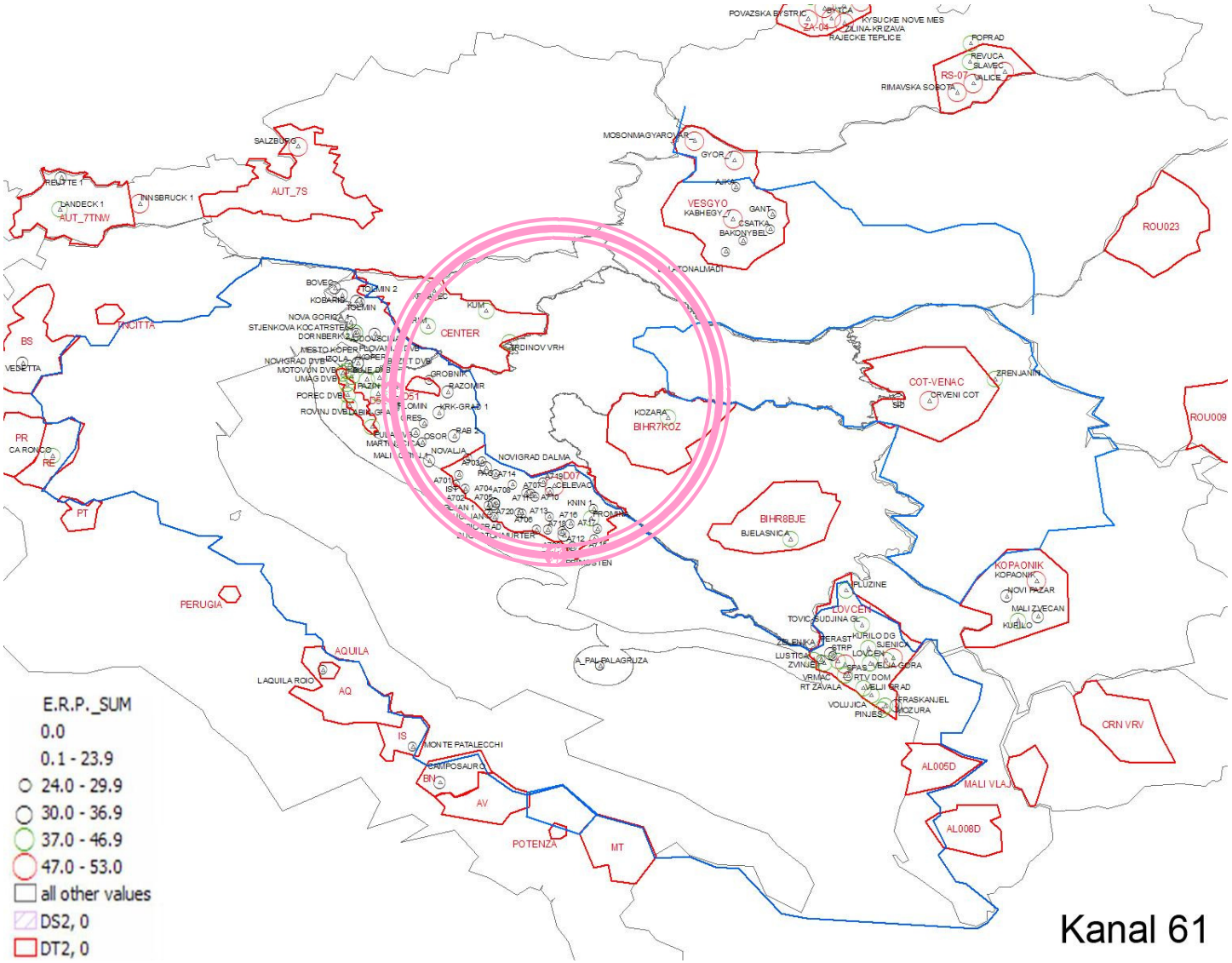
BIH	BJELAŠNICA	KOZARA	LEOTAR	MAJEVICA	PLJEŠEVICA	TROVRH	TUŠNICA	VELEŽ	VLAŠIĆ
1	24	27	32	25	24	21	25	26	22
2	28	32	40	31	47	48	38	36	29
3	30	33	46	53	50	33	44	39	35
4	40	37	56	55	52	38	49	42	46
5	47	45	52	60	55	44	58	50	57
6	54	61	63	65	65	45	60	55	59
7	61	66	65	68	67	58	62	69	64

U opsegu 61-69 nalazi se pokrivanja u:

- 4 regije iz mreže 6,

- 8 regija iz mreže 7.

Kanal 61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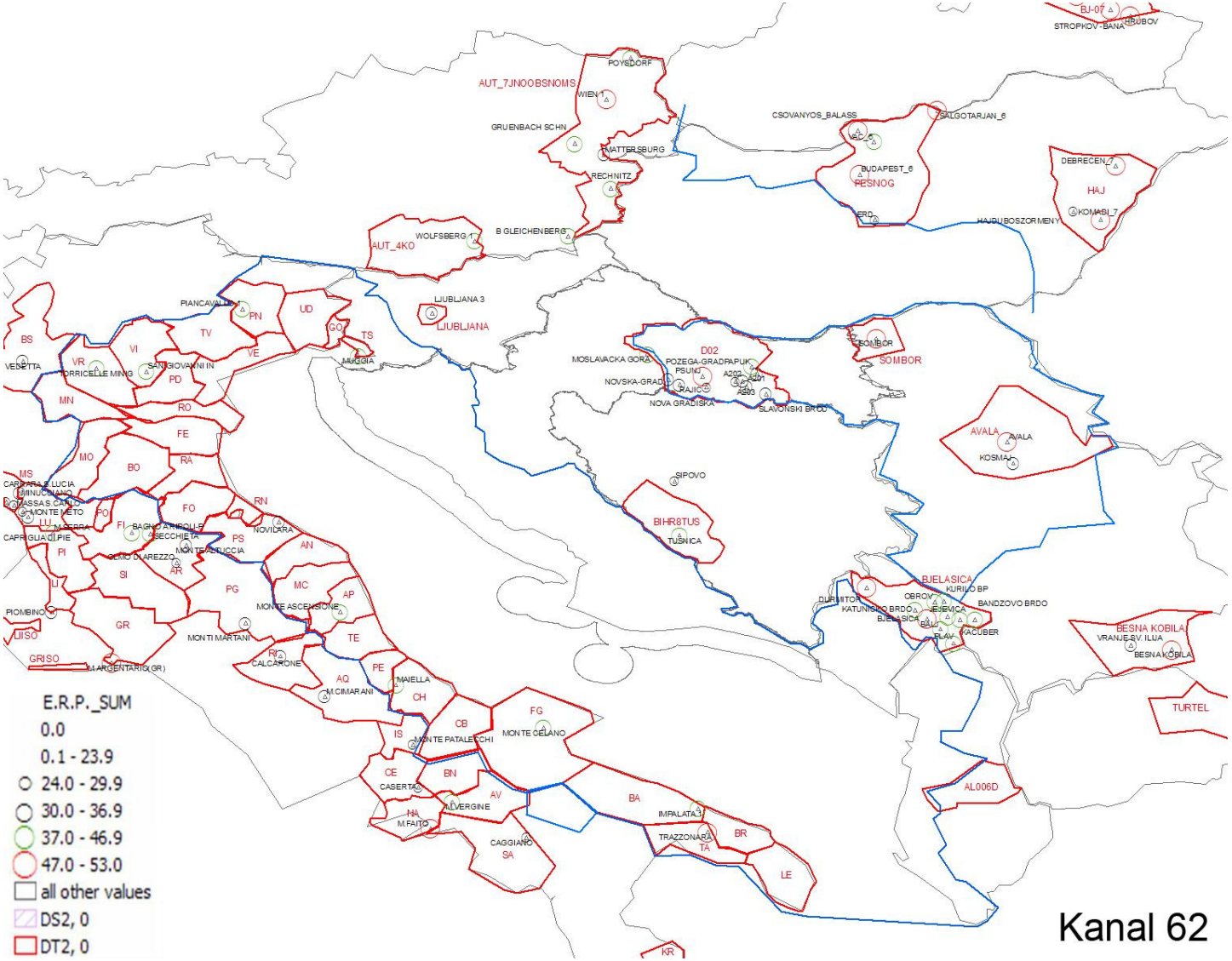
0.0
0.1 - 23.9
24.0 - 29.9
30.0 - 36.9
37.0 - 46.9
47.0 - 53.0
all other values
DS2, 0
DT2, 0
Kanal 61

Kanal 62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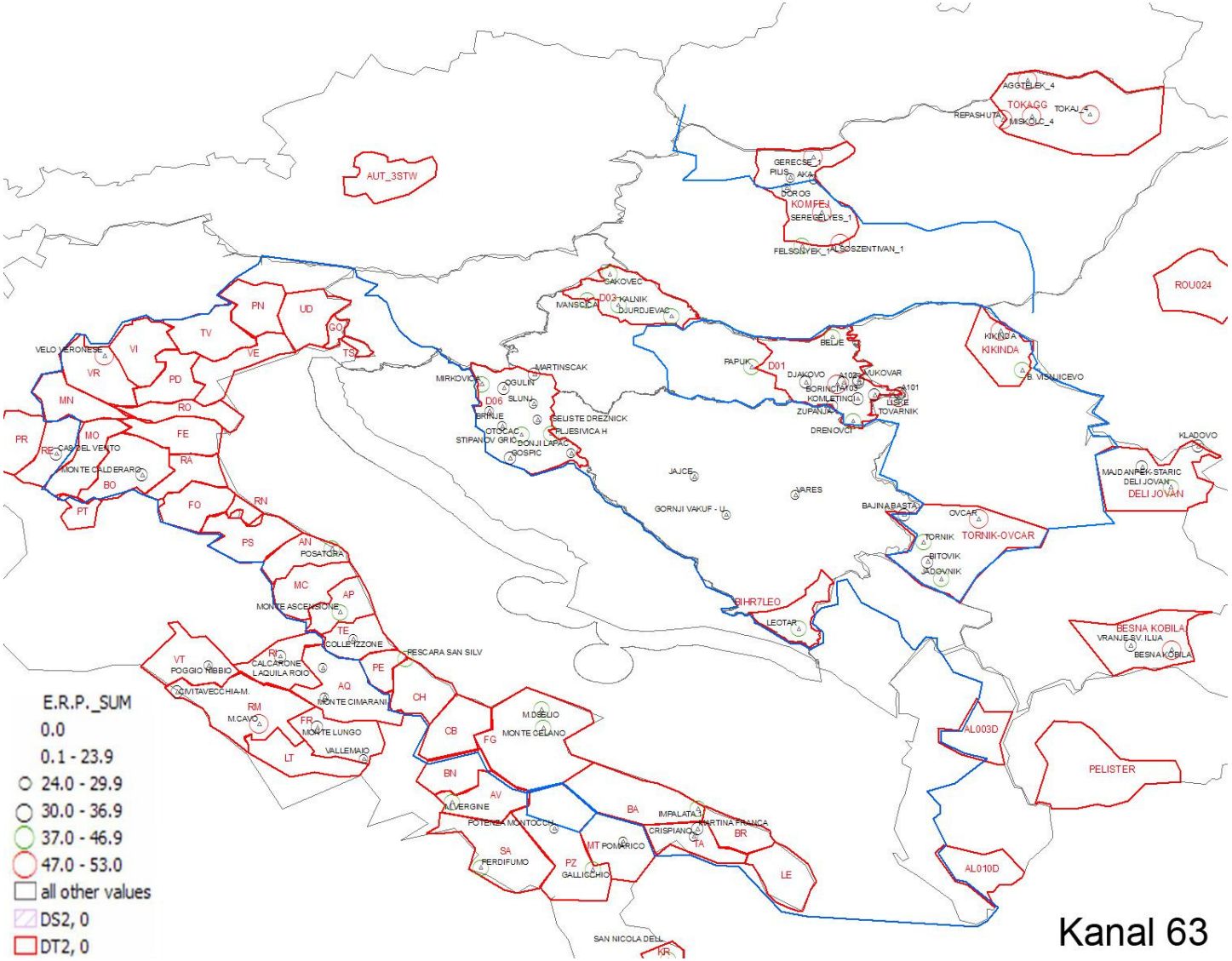
all other values
DS2, 0
DT2, 0
Kanal 62

Kanal 63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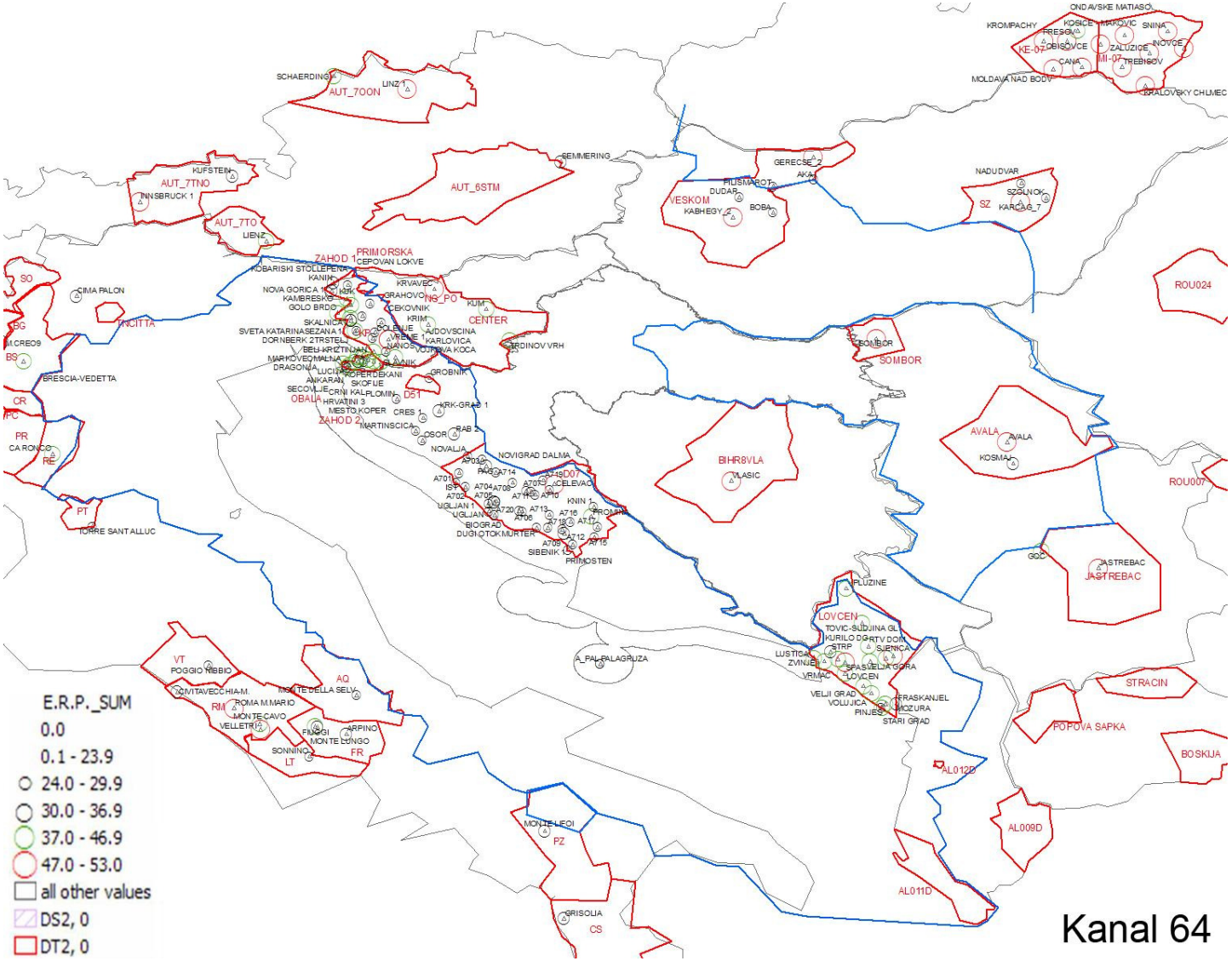
DS2, 0
DT2, 0
Kanal 63

Kanal 64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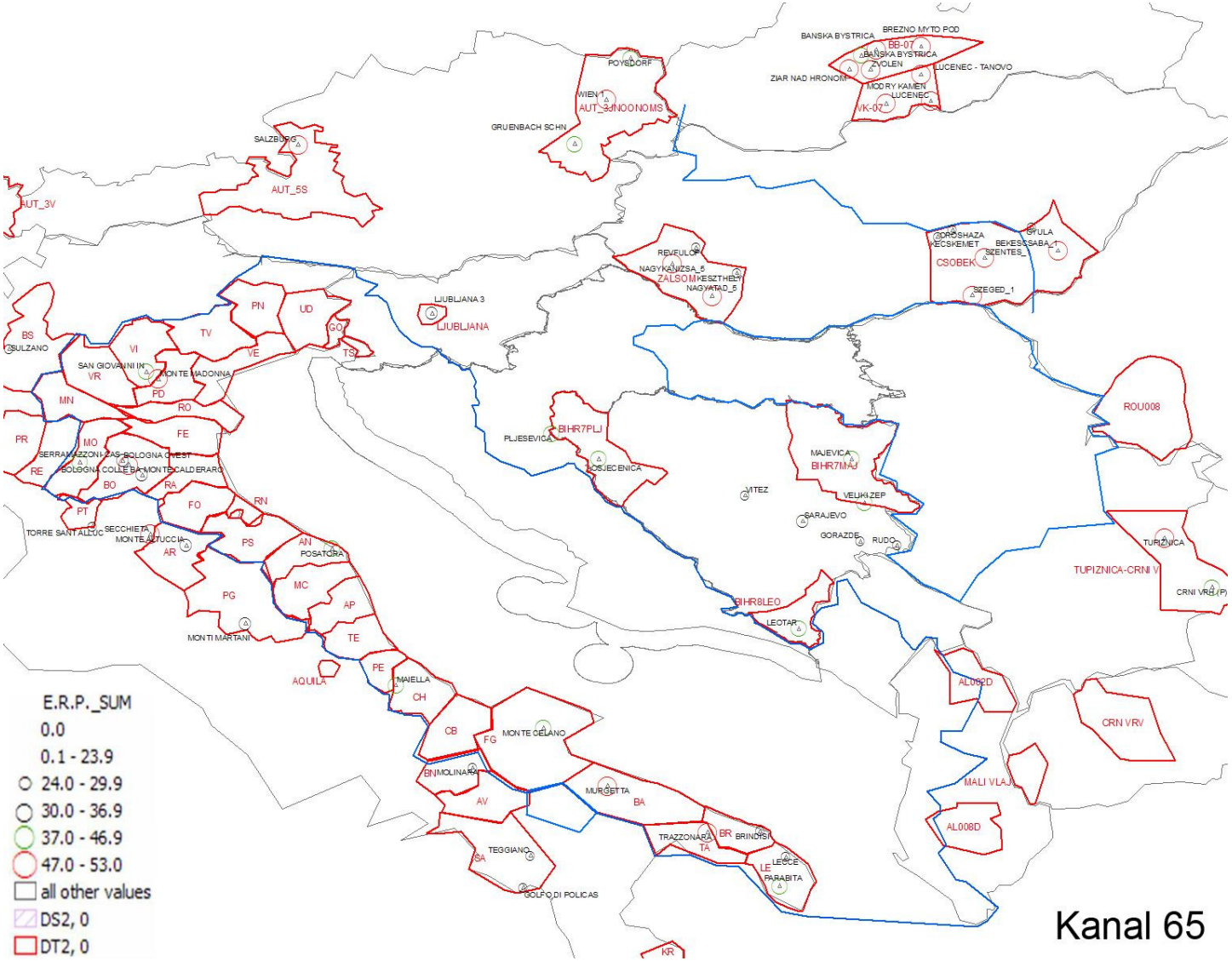
DT2, 0
Kanal 64

Kanal 65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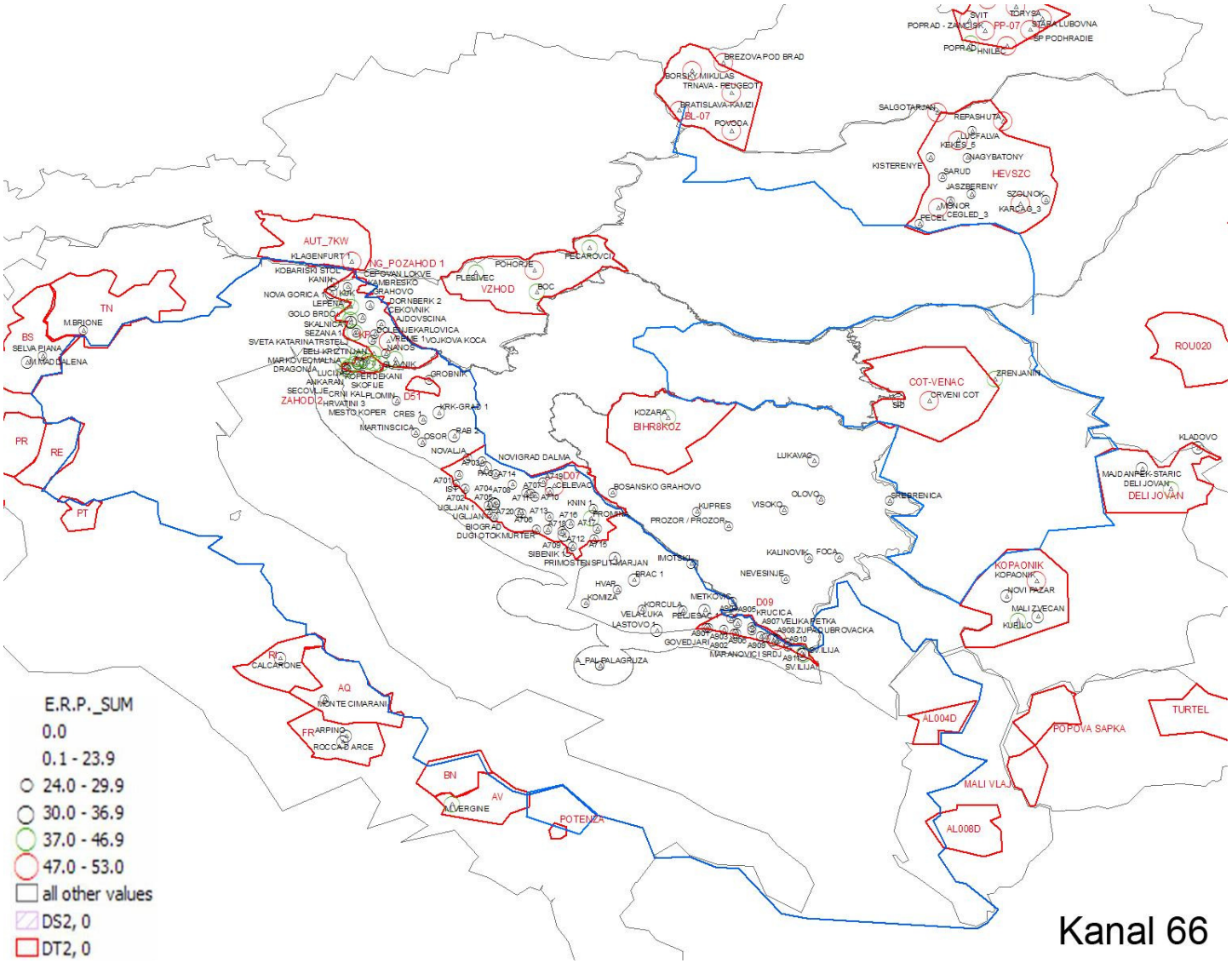
DT2, 0
Kanal 65

Kanal 66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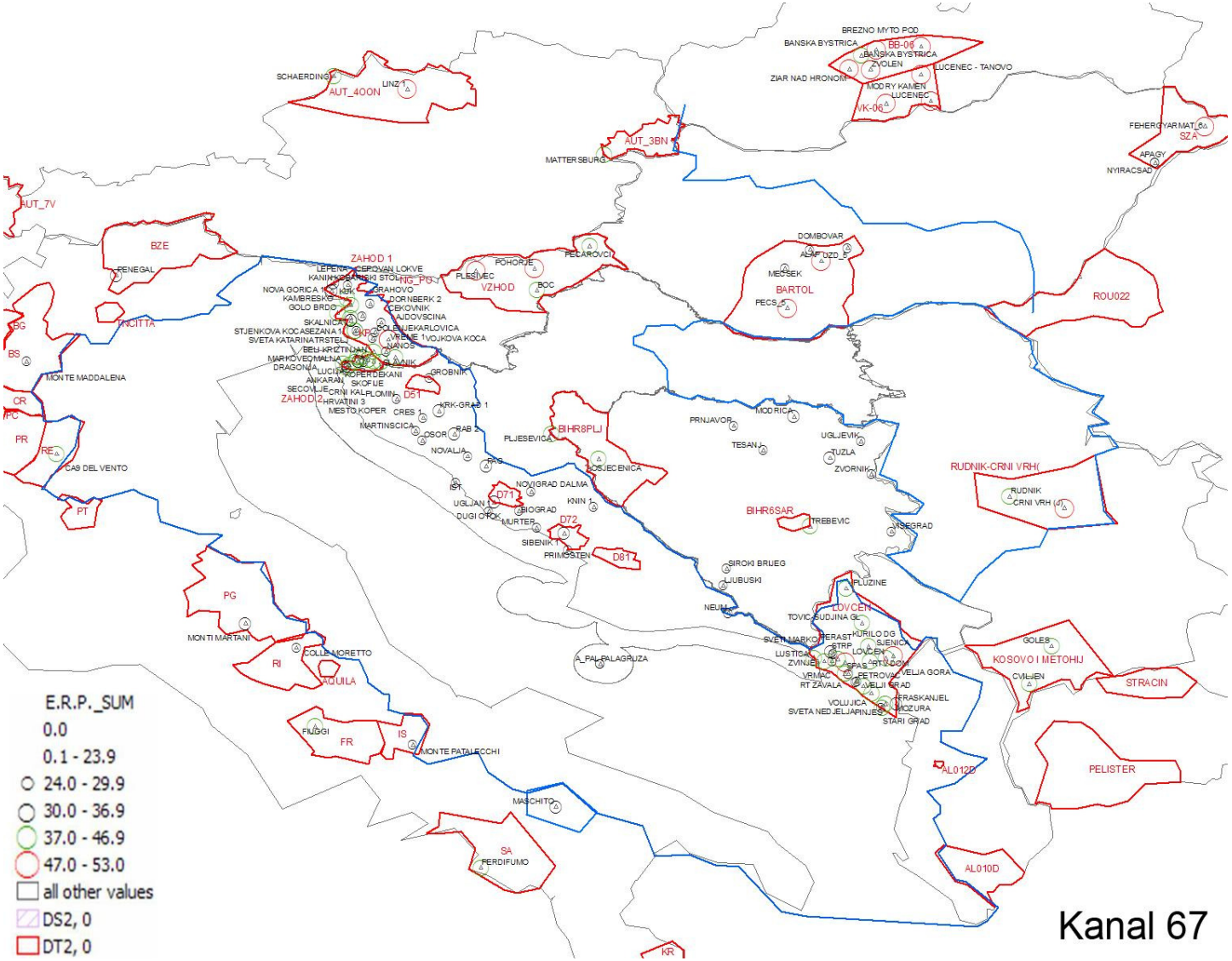
DS2, 0
DT2, 0
Kanal 66

Kanal 67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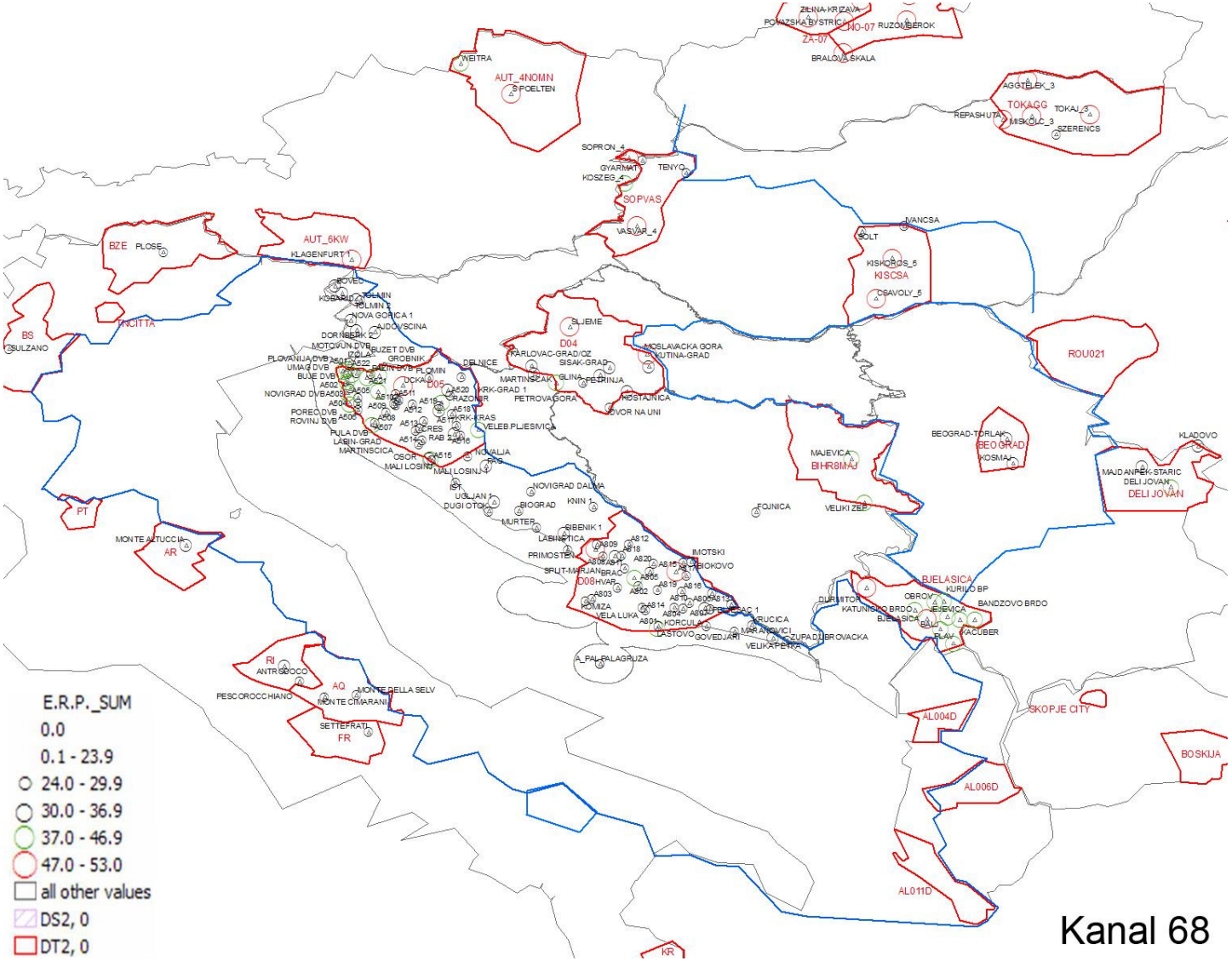
Kanal 67

Kanal 68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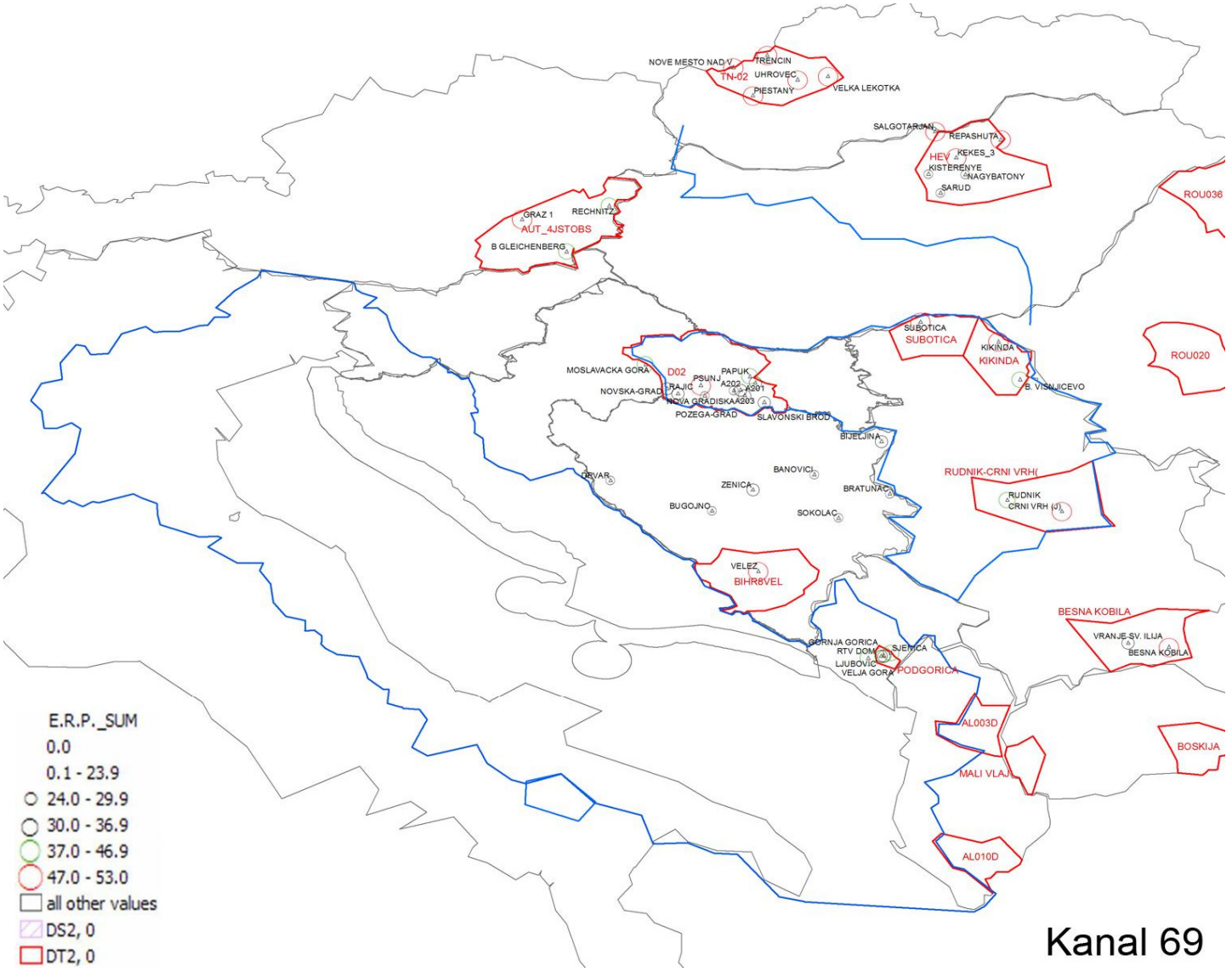
DT2, 0
Kanal 68

Kanal 69


NOVE MESTO NAD V
TRENCIN
TN-02
UHROVEC
PIESTANY
VELKA LEKOTKA
SALGOTARJAN
REPASHUTA
KEKES_3
HEV
KISTERENYE
NAGYBATONY
SARUD
ROU036
GRAZ 1
RECHNITZ
AUT_4JSTOBS
B GLEICHENBERG
SUBOTICA
SUBOTICA
KIKINDA
KIKINDA
ROU020
B. VISNJICEVO
MOSLAVACKA GORA
D02
PSUNJ
PAPUK
A202
A201
RAJIC
NOVSKA-GRAD
NOVA GRADISKA
A203
POZEGA-GRAD
SLAVONSKI BROD
BIJELJINA
BANOVICI
DEVAR
ZENICA
BRATUNAC
RUDNIK-CRNI VRH(
RUDNIK
CRNI VRH (J
BUGOJNO
SOKOLAC
VELEZ
BIHR6VEL
BESNA KOBILA
VRANJE SV. ILIJA
BESNA KOBILA
GORNJA GORICA
RTV DOM
SJENICA
LJUBOVIC
VELJA GORA
PODGORICA
AL003D
BOSKIJA
MALI VLAJ
AL010D
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37.0 - 46.9
47.0 - 53.0
all other values
DS2, 0
DT2, 0
Kanal 69

Situacija u zemljama u regiji

- AUT, HNG, SVN, HRV i BiH su odlučile koristiti opseg 790-862 MHz za mobilne i broadband usluge
- AUT, HNG, SVN, HRV i BiH će postepeno osloboditi opseg 790-862 MHz od ATV i DVB-T usluga

ECC REPORT 142

Electronic Communications Committee (ECC)
within the European Conference of Postal and Telecommunications Administrations (CEPT)

REARRANGEMENT ACTIVITIES FOR BROADCASTING SERVICES IN ORDER TO FREE THE SUB-BAND 790 - 862 MHz

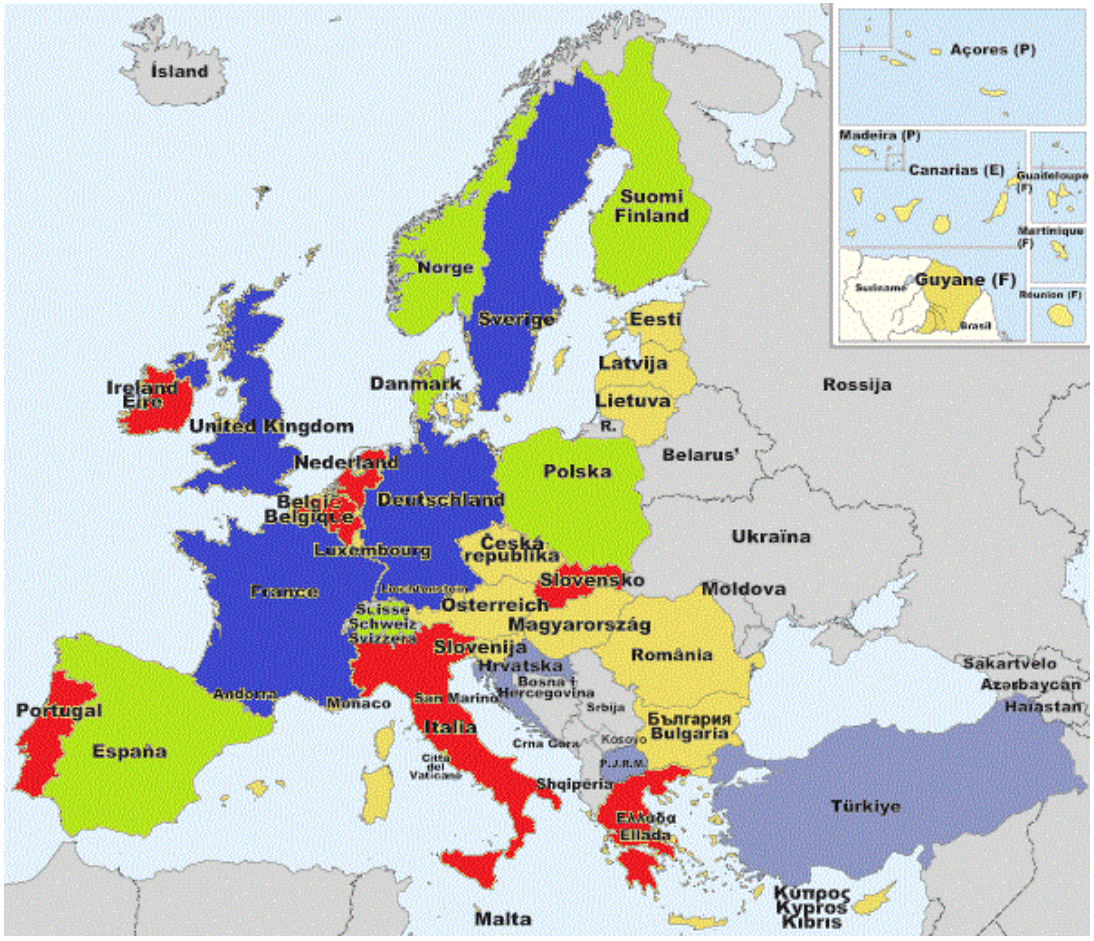
Cork, February, 2010

Strictly applying the standardized GE06 planning network structures during the coordination process will most likely not lead to a successful coordination result. In order to facilitate coordination, methods need to be developed and applied which allow the identification of new additional frequency resources for broadcasting which may be used whilst:

- guaranteeing the rights of the GE06 Agreement and Plan,
- also guaranteeing the ease of implementation of Plan entries based on existing rights,
- not causing unacceptable interference to existing network's coverage areas, operated in accordance with GE06 and bi- and multilateral side agreements and
- preserving the rights of equitable access to the spectrum for all parties involved.

One option to find solutions could be to apply the GE06 framework on networks that, show different technical characteristics than those being part of the GE06 Plan.

Digitalna dividenda u Evropi



Aukcije u 2010

Planirana mobilna

Javne konsultacije

Primjer: Njemačka aukcija spektra

Auktionsrundenergebnis

Ende der Auktion (12.04. – 20.05. 2010)

Frequenzbereich	Block	Ausstattung	Höchst-bieter	Höchstgebot (€ in Tsd)
0,8 GHz (gepaart)	0,8 GHz A	2x5 MHz konkret	To2 GER	616.595
	0,8 GHz B	2x5 MHz abstrakt	To2 GER	595.760
	0,8 GHz C	2x5 MHz abstrakt	Telekom D	570.849
	0,8 GHz D	2x5 MHz abstrakt	Telekom D	582.949
	0,8 GHz E	2x5 MHz abstrakt	Vodafone	583.005
	0,8 GHz F	2x5 MHz abstrakt	Vodafone	627.317
1,8 GHz (gepaart)	1,8 GHz A	2x5 MHz abstrakt	Telekom D	20.700
	1,8 GHz B	2x5 MHz abstrakt	Telekom D	20.700
	1,8 GHz C	2x5 MHz abstrakt	Telekom D	19.869
	1,8 GHz D	2x5 MHz konkret	E-Plus Grp	21.550
	1,8 GHz E	2x5 MHz konkret	E-Plus Grp	21.536
2,0 GHz (gepaart)	2,0 GHz A	2x4,95 MHz konkret	Vodafone	93.757
	2,0 GHz B	2x4,95 MHz konkret	E-Plus Grp	103.323
	2,0 GHz C	2x4,95 MHz konkret	E-Plus Grp	84.064
	2,0 GHz D	2x4,95 MHz konkret	To2 GER	66.931
2,0 GHz (ungepaart)	2,0 GHz E	1x5 MHz konkret	To2 GER	5.731
	2,0 GHz F	1x14,2 MHz konkret	To2 GER	5.715

Frequenzbereich	Block	Ausstattung	Höchst-bieter	Höchstgebot (€ in Tsd)
2,6 GHz (gepaart)	2,6 GHz A	2x5 MHz abstrakt	Telekom D	19.096
	2,6 GHz B	2x5 MHz abstrakt	Telekom D	19.025
	2,6 GHz C	2x5 MHz abstrakt	To2 GER	17.364
	2,6 GHz D	2x5 MHz abstrakt	To2 GER	17.364
	2,6 GHz E	2x5 MHz abstrakt	Vodafone	18.948
	2,6 GHz F	2x5 MHz abstrakt	Vodafone	19.025
	2,6 GHz G	2x5 MHz abstrakt	Telekom D	19.069
	2,6 GHz H	2x5 MHz abstrakt	Telekom D	19.038
	2,6 GHz I	2x5 MHz abstrakt	To2 GER	18.948
	2,6 GHz J	2x5 MHz abstrakt	E-Plus Grp	18.931
	2,6 GHz K	2x5 MHz abstrakt	E-Plus Grp	17.739
	2,6 GHz L	2x5 MHz abstrakt	To2 GER	17.739
	2,6 GHz M	2x5 MHz abstrakt	Vodafone	17.739
	2,6 GHz N	2x5 MHz abstrakt	Vodafone	17.752
2,6 GHz (ungepaart)	2,6 GHz O	1x5 MHz abstrakt	Vodafone	9.130
	2,6 GHz P	1x5 MHz abstrakt	Vodafone	9.130
	2,6 GHz Q	1x5 MHz abstrakt	Telekom D	8.598
	2,6 GHz R	1x5 MHz abstrakt	Vodafone	8.598
	2,6 GHz S	1x5 MHz abstrakt	Vodafone	9.051
	2,6 GHz T	1x5 MHz abstrakt	Vodafone	9.051
	2,6 GHz U	1x5 MHz abstrakt	E-Plus Grp	8.273
	2,6 GHz V	1x5 MHz abstrakt	To2 GER	8.229
	2,6 GHz W	1x5 MHz abstrakt	To2 GER	8.229
	2,6 GHz X	1x5 MHz abstrakt	E-Plus Grp	8.229

Ausgeschiedene Bieter:

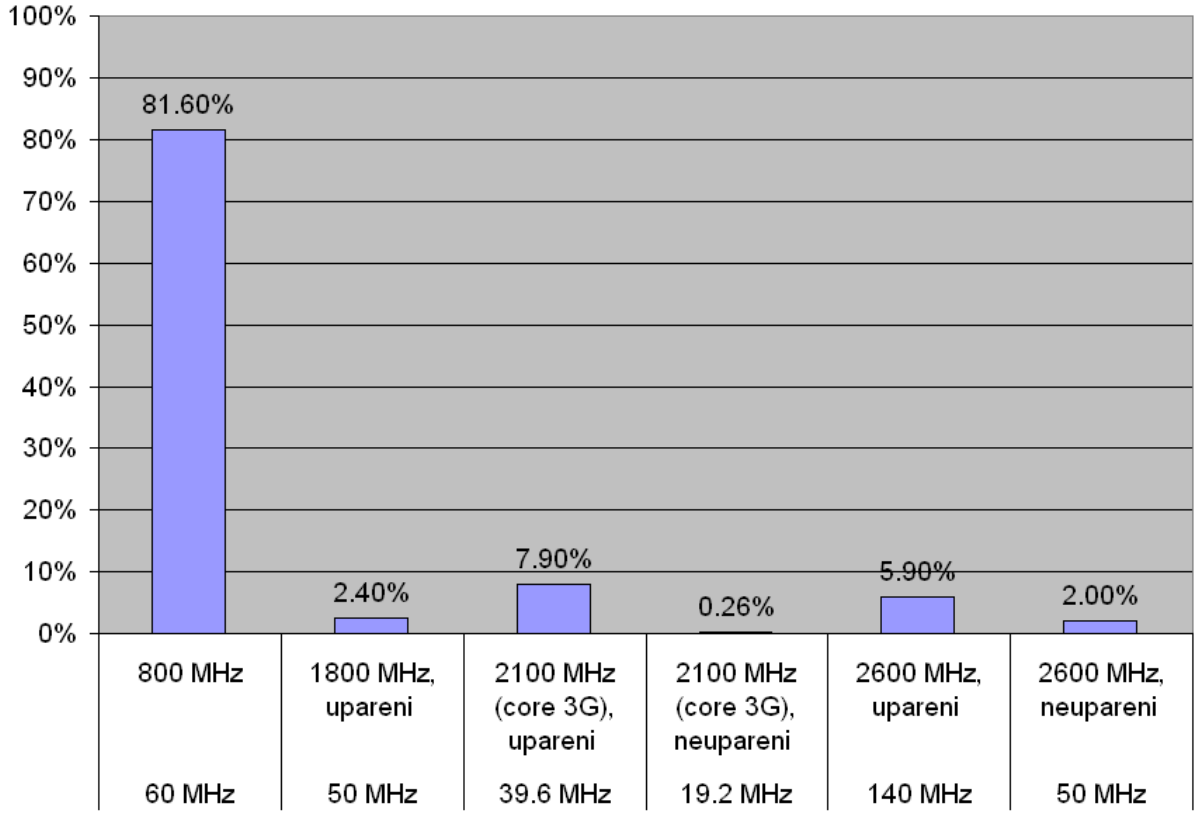
Summe aller gehaltener Höchstgebote (€ in Tsd)	4.384.646
Zahlungsverpflichtung aufgrund zurück-genommener Höchstgebote (€ in Tsd)	0
Summe	4.384.646

Četiri frekvencijska opsega

Statistika sa aukcije u Njemačkoj

Ukupna ponuda iznosi: 4.385.000.000 €

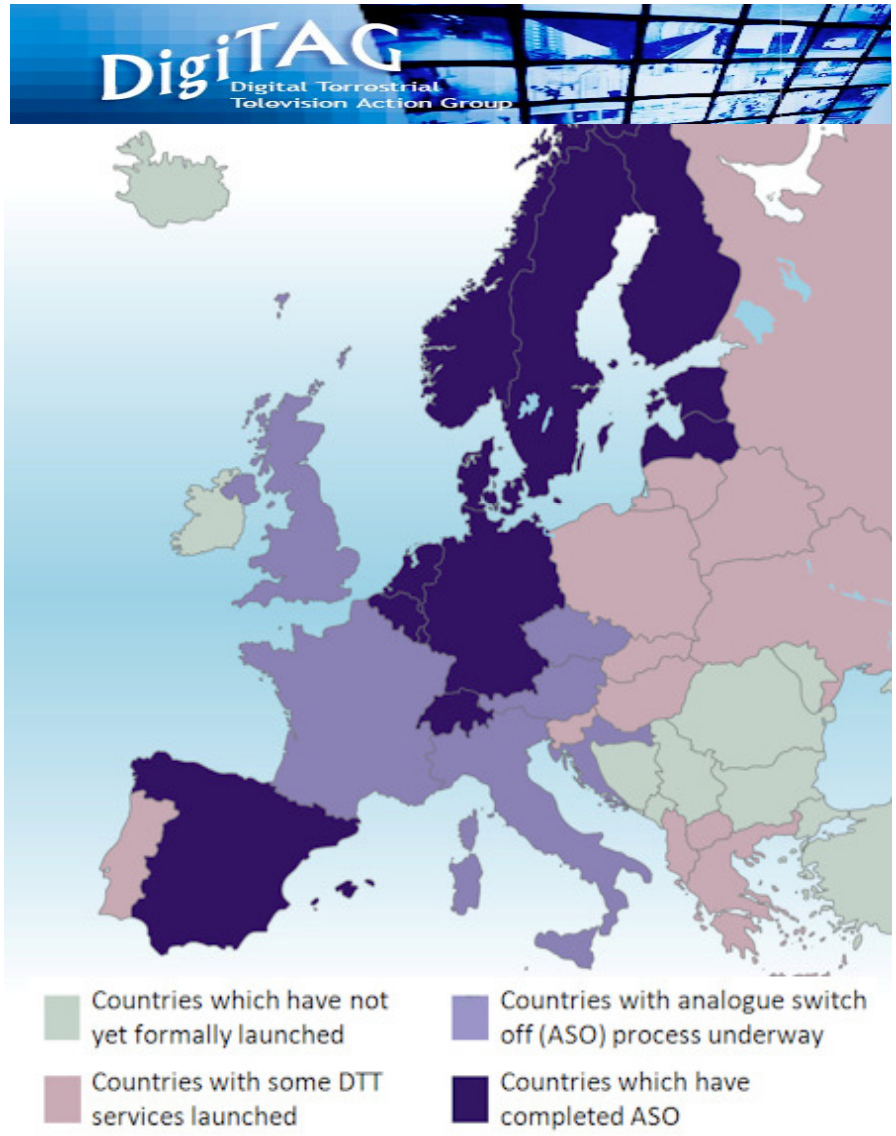
Frekvencijski opseg	Širina opsega (MHz)	Prikupljeni iznos (€ mn, %)
800 MHz (digitalna dividenda), upareni	**60**	**3.576.475** **81.6%**
1800 MHz, upareni	**50**	104.355 2.4%
2100 MHz (core 3G), upareni	**39.6**	384.075 7.9%
2100 MHz (core 3G), neupareni	**19.2**	11.446 0.26%
2600 MHz, upareni	**140**	257.777 5.9%
2600 MHz, neupareni	**50**	86.518 2.0%



Njemačka ekonomska statistika:
Stanovništvo:
BDP po stanovniku:

BDP: € 2.380 milijardi eura
81.760.000
29,355 €

Evropa – gašenje analogne TV



ANALOGUE SWITCH-OFF DATES

Switching off analogue television

In many European countries, planning for analogue switch-off is well underway with several countries having already completed the process.

It is expected that most European countries will have switch-off their analogue services by 2015, if not earlier. The European Commission recommends that its Member-States complete the process by 2012.

Announced digital switchover dates

Country	Launch date	Compression format	Completion of ASO
UK	1998	MPEG-2	2012
Sweden	1999	MPEG-2	Completed
Spain	2000/ 2005	MPEG-2	Completed
Finland	2001	MPEG-2	Completed
Switzerland	2001	MPEG-2	Completed
Germany	2002	MPEG-2	Completed
Belgium (Flemish)	2002	MPEG-2	Completed
NL	2003	MPEG-2	Completed
Italy	2004	MPEG-2	2012
France	2005	MPEG-2/MPEG-4 AVC	2011
Czech Republic	2005	MPEG-2	2011
Denmark	2006	MPEG-2/MPEG-4 AVC	Completed
Estonia	2006	MPEG-4 AVC	Completed
Austria	2006	MPEG-2	2010
Slovenia	2006	MPEG-4 AVC	Completed
Norway	2007	MPEG-4 AVC	Completed
Lithuania	2008	MPEG-4 AVC	2012
Hungary	2008	MPEG-4 AVC	2011
Ukraine	2008	MPEG-4 AVC	2014
Latvia	2009	MPEG-4 AVC	Completed
Portugal	2009	MPEG-4 AVC	2012
Croatia	2009	MPEG-2	2011
Poland	2009	MPEG-4 AVC	2013
Slovakia	2009	MPEG-2	2012
Ireland	2010	MPEG-4 AVC	2012
Russia	TBC	MPEG-4 AVC	2015

Digitalna Agenda

EUROPEAN COMMISSION

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COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

A Digital Agenda for Europe

2.4.1. Guarantee universal broadband coverage with increasing speeds

Wireless (terrestrial and satellite) broadband can play a key role to ensure coverage of all areas including remote and rural regions. The central problem to develop wireless broadband networks today is access to radio spectrum. Mobile internet users already experience congestion on networks because of inefficient use of radio spectrum. In addition to frustrating users, innovation in markets for new technologies is stifled, affecting € 250 billion of activity annually[26]. A forward-looking European spectrum policy should, while accommodating broadcasting, promote efficient spectrum management, by mandating the use of certain digital dividend frequencies for wireless broadband by a fixed future date, by ensuring additional flexibility (also allowing spectrum trading) and by supporting competition and innovation.

Univerzalni širokopojasni pristup velike brzine će koristiti opsed DD.

Zaključak

Očekuje se da će do 2012. godine u većini zemalja Evropske unije biti završen prijelaz sa analognog na digitalno zemaljsko emitovanje.

Nakon prelaska na digitalno zemaljsko emitovanje, oslobodit će se značajna količina visokokvalitetnog radio spektra u UHF opsegu, koji će omogućiti implementaciju novih tehnologija i usluga.

Ova 'digitalna dividenda' može potaknuti kako radiodifuzni sektor tako i industriju bežičnih komunikacija, da ponude širok dijapazon društvenih i kulturnih pogodnosti.

Hvala na pažnji!

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