

TV info

**Strategy**

Implementation

**ASO**

DTV Broadcasting

**Digital Dividend**

Region

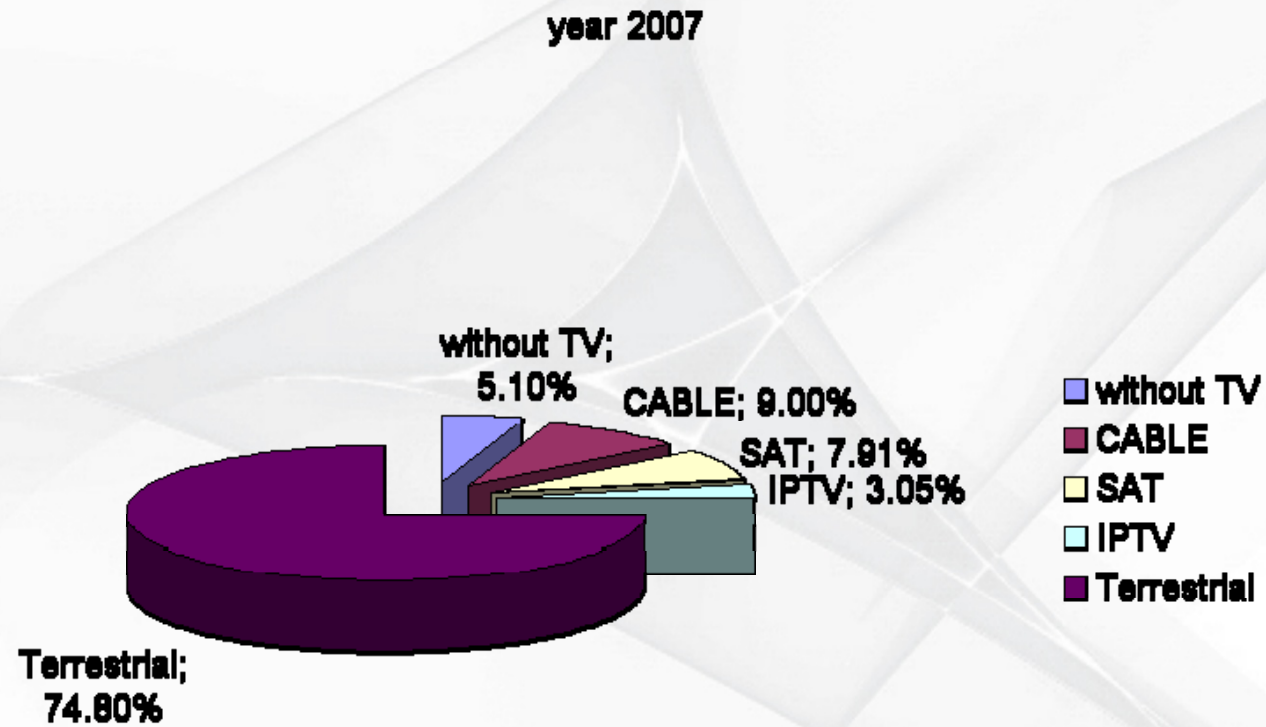
# Analogue TV switchover and digital dividend in Croatia

Danijel Vidaković

**EBU Workshop - Implementation of the Digital Dividend  
in the European Countries**

## TV platforms in Croatia

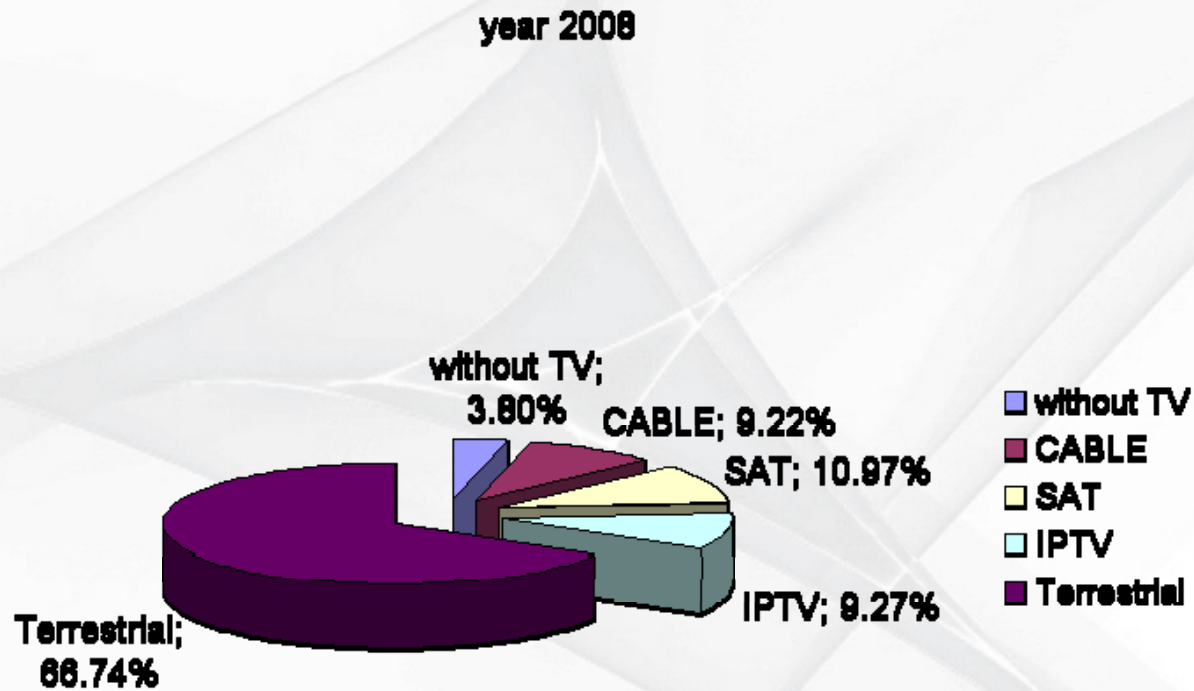
## ■ TV platforms in 2007



Croatian statistical year book and public available data

## TV platforms in Croatia

## ■ TV platforms in 2008

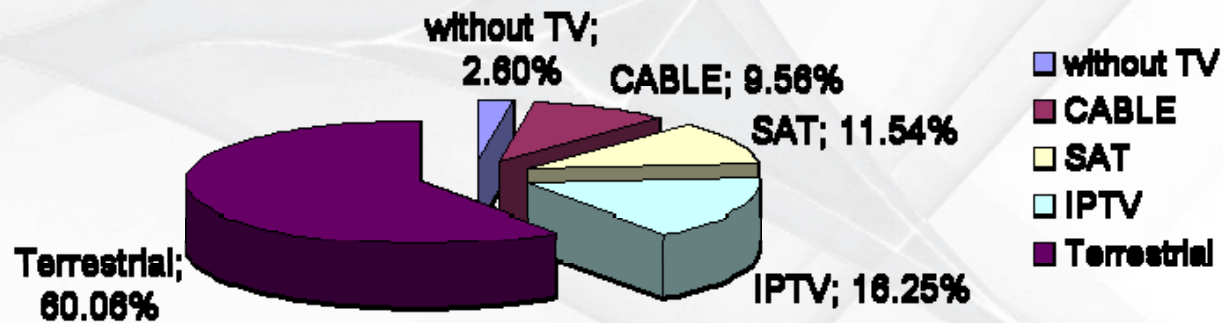


Croatian statistical year book and public available data

## TV platforms in Croatia

## ■ TV platforms in 2009/2010

year 2009 - beginning 2010



Croatian statistical year book and public available data

## Analogue to Digital Television Switchover in Croatia

### “Analogue to Digital Television Broadcasting Switchover Strategy for the Republic of Croatia”

- Adopted by Government of the Republic of Croatia on 31 July 2008
- Defines basic strategic guidelines for the analogue to digital TV switchover process in Croatia
- Main strategic goal is full analogue to digital TV switchover by **1 January 2011**
- Other strategic guidelines:
  - to provide conditions for preserving free, universal and public TV broadcasting services for all broadcasters on national, regional and local level
  - to ensure technical – technological preconditions by optimal use of transmission capabilities to meet public interests
  - to provide access conditions for independent content providers
  - to support development of content and media pluralism on the open service market

## Analogue to Digital Television Switchover in Croatia

- population coverage 95% for the existing analogue TVs on national level

The logo for HRT1, featuring the letters 'HRT1' in a bold, black, sans-serif font.The logo for HRT2, featuring the letters 'HRT2' in a bold, black, sans-serif font.The logo for RTL Televizija, featuring the letters 'RTL' in a bold, black, sans-serif font with 'TELEVIZIJA' written below it.The logo for Nova, featuring a stylized red 'n' inside a red circle with the word 'nova' written below it.

- MPEG-2 for SDTV, MPEG-4 Part 10 (H.264/AVC) for HDTV, “Pay-TV”
- switchover concept: region by region
  - 9 “digital regions” – each consists of one ore more counties







# Analogue to Digital Television Switchover in Croatia

- population coverage 95% for the existing analogue TVs on national level



- MPEG-2 (SDTV), MPEG-4 Part 10 (HDTV, “Pay-TV”)

- switchover concept: **region by region**

- 9 “digital regions” – each consists of one or more counties

- First phase

- two national MUXs (MUX A & MUX B)

- 4-5 SDTV programs/MUX

- content - free to air, countrywide programs(simulcast of 4 ATV + additional)

- Secound phase

- switchover of regional ATV programs (January 2010) + additional regional content (MUX D)

- additional multiplexes for new HDTV/SDTV programs (MUX C) and mobile TV (DVB-H)

## Analogue to Digital Television Switchover in Croatia

- Analogue to digital switchover is completed → DIGITAL DIVIDEND
- Based on the *Radio Frequency Allocation Plan for Radio and Television Programme Broadcasting in the Republic of Croatia* within UHF IV/V and VHF III, there is a possibility of widening the area of providing the existing radio and television services, as well as of introducing new, additional electronic communications services:
  - additional countrywide digital terrestrial television programmes (SDTV, HDTV)
  - digital terrestrial television programmes at regional and local level,
  - television services for mobile phones (DVB-H) and other types of mobile video and multimedia,
  - mobile communications, such as voice calls or information data,
  - wireless broadband communications services,
  - wireless microphones for theatres, television and radio production and live music events,
  - short range wireless applications, such as fixed wireless access at home,
  - public safety services, such as wireless communications for the emergency services.

# Analogue to Digital Television Switchover in Croatia

- Analogue to digital switchover is completed → DIGITAL DIVIDEND
- UHF frequency bands IV and V – available multiplexes and associated services

channel	21	55	56	60	61	69	70
frequency	470MHz		750MHz		790MHz		860MHz
service	DVB-T/H		DVB-T		IMT		
<b>MUX A - national</b>	5XSDTV*						
<b>MUX B - national</b>	5XSDTV**						
<b>MUX C - national</b>	5xSDTV: additionally available						
<b>MUX D - regional /national</b>	1-3xSDTV***: existing regional programs + 2-4 SDTV: additionally available (regional/national)						
<b>MUX E - national</b>	DVB-H: additionally available ~30 TV programs or ~ 60 radio programs						
<b>MUX F - national /regional</b>	additionally available: DVB-T ili DVB-H						
<b>MUX G - regional /national</b>	additionally available: DVB-T ili DVB-H						
<b>MUX H - regional</b>	additionally available: DVB-T ili DVB-H						

## Analogue to Digital Television Switchover in Croatia

- Analogue to digital switchover is completed → DIGITAL DIVIDEND
- VHF frequency band III - available multiplexes and associated services

channel	5	12	13
frequency	174MHz		230MHz
service	DVB-T/DVB-H/T-DAB/DMB		
<b>MUX VHF - national /regional</b>	<i>additionally available:</i> DVB-T, DVB-H, T-DAB, DMB		

## Analogue to Digital Television Switchover in Croatia

- The Strategy is supported by two Action plans:  
(tasks, activities, deadlines, stakeholders)
  
- Action Plan for the Analogue to Digital Terrestrial Television Broadcasting Switchover in "digital regions":
  - ensuring frequencies for DTV networks (HAKOM)
  - promotion campagne and informing the public (Central State Administrative Office for e-Croatia)
  - distribution of subsidy vouchers (PSB)
  - comencing the simulcast, switching on DTV (Network operator)
  - switching off ATV (TV broadcaster)

## Analogue to Digital Television Switchover in Croatia

- The Strategy is supported by two Action plans:  
(tasks, activities, deadlines, stakeholders)
  
- **Action Plan for the Implementation of the Promotion Campaign:**
  - informing the public on the reasons for ATV to DTV switchover (e-Croatia)  
(TV commercials, mascot and logo, brochure, web site, etc.)
  
  - educating the public on digital television benefits (e-Croatia)  
(indirect – TV shows, conferences, workshops and round tables, on-line quiz, banners, etc., direct – "Digital Switchover Road Show" (experts providing information) across Croatia's towns)
  
  - ensuring the right to information and help in the process of ATV to DTV switchover for all the citizens of the Republic of Croatia:  
(DTV Call Centre (0800 11 20 11), "DTV for everybody" event, etc.)

# Analogue to Digital Television Switchover in Croatia

- Basic legislation relevant to the implementation of DTV:
  - Electronic Communications Act (OG 73/08)
  - Electronic Media Act (OG 122/03, 79/07 & 32/08), **NEW!** (OG 153/09)
  - Croatian Radio-Television Act (OG 25/03)
  
- Ordinance on Analogue to Digital Radio and Television Broadcasting Switchover and Access to Multiplex Positions in Terrestrial Digital Broadcasting (OG 148/08)
  - transition (simulcast) period
  
  - digital broadcasting, access to MUX positions (capacity)
  
  - preconditions for ATV to DTV switchover
    - relevant population coverage
    - existing ATV program broadcasted in digital as well
    - provided all relevant information to the public about ATV to DTV switchover

## Analogue to Digital Television Switchover in Croatia

- Other adopted documents relevant to the implementation of DTV:

### Decisions adopted by Government of the Republic of Croatia

- Decision on the start of DTV broadcasting and the end of ATV broadcasting in the Republic of Croatia, Adopted by Government of the Republic of Croatia
- Decision on manner of distribution of subsidies and criteria and conditions of granting the subsidies to the TV subscribers (natural persons), in order to purchase DTV receivers for the reception of DTV programmes
  - ensures the digital receivers subsidising in a technologically neutral way
  - each TV subscriber (natural person) is entitled to the subsidy in amount of 75,00 HRK (approx. 10 EUR), in the form of voucher
  - vouchers shall be used before 31 December 2010



# Analogue to Digital Television Switchover in Croatia

## Subsidy voucher and information brochure



 VLADA REPUBLIKE HRVATSKE

### KUPON ZA POPUST PRI KUPNJI DIGITALNOG PRIJAMNIKA

BROJ: 5476  
 IME I PREZIME: **MARIJANA ANTENOVIĆ-KUPONIĆ**  
 ADRESA: **ZAGREBAČKA 18b,**  
**10000 ZAGREB**  
 PRETPLATNIČKI BROJ: **123456709012345**

0 36000 29145 2

IZNOS POPUSTA: 75,00 kn

**KUPON ZA POPUST PRI KUPNJI DIGITALNOG PRIJAMNIKA**

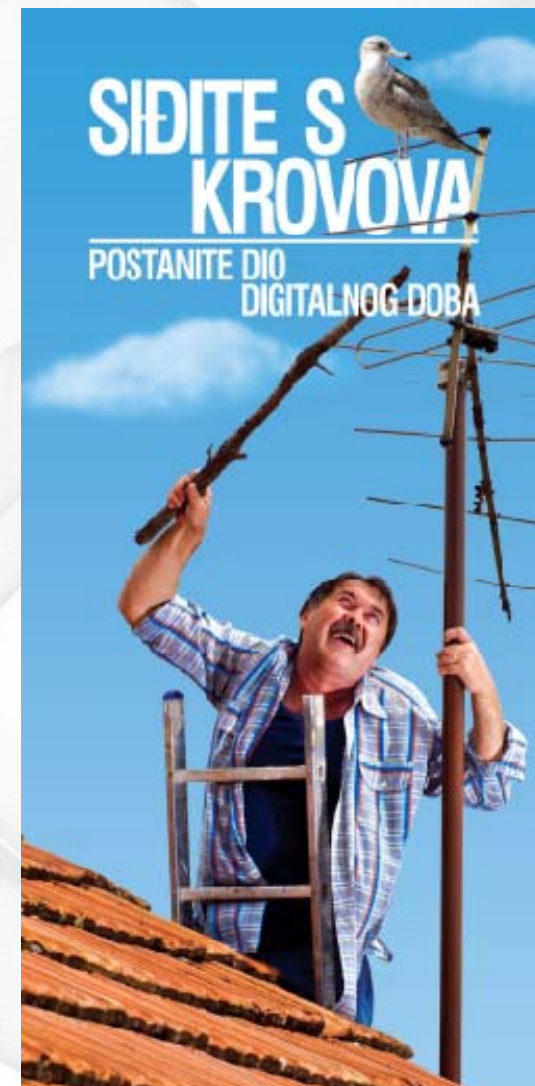
BROJ: 5476

IME I PREZIME: **MARIJANA ANTENOVIĆ-KUPONIĆ**

ADRESA: **ZAGREBAČKA 18b,**  
**10000 ZAGREB**

PRETPLATNIČKI BROJ: **123456709012345**

IZNOS POPUSTA: 75,00 kn

## Analogue to Digital Television Switchover in Croatia

- HAKOM invited for public consultation on tendering documentation
- 2 February 2009 HAKOM started tendering procedure for granting the individual rights for the use of radiofrequency spectrum for providing electronic communication service managing two DTV broadcasting networks countrywide ( MUX A and MUX B)
  - license duration 10 years
  - required network coverage of 95% population
  - MPEG-2, 4-5 SDTV programs, statistical multiplexing
  - required bitrate 19.91 Mbit/s (e.g. 64QAM, GI=1/4, CR=2/3)
  - to ensure multiplexing service
  - must carry obligation for existing analogue programs
- documentation was available in electronic format at the HAKOM's web site and in paper on request
- 30 March 2009 deadline for bidder's application
  - HT-Hrvatske telekomunikacije d.d.
  - Odašiljači i veze d.o.o.

# Analogue to Digital Television Switchover in Croatia

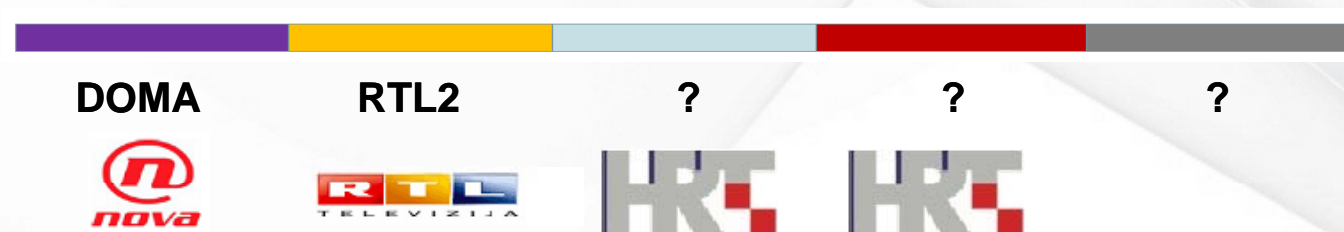
## ■ 24 April 2009 HAKOM's Decision on granting the license to Odašiljači i veze d.o.o.

- license duration 10 years
- required network coverage of 95% population (98% MUX A, 95% MUX B)
- MPEG-2, 4-5 SDTV programs, statistical multiplexing (5 SDTV programs)
- required bitrate 19.91 Mbit/s (22.39 Mbit/s)
- to ensure multiplexing service
- must carry obligation for existing analogue programs

MUX A - 4 existing ATV programs + 1 additional new



MUX B - 5 new programs

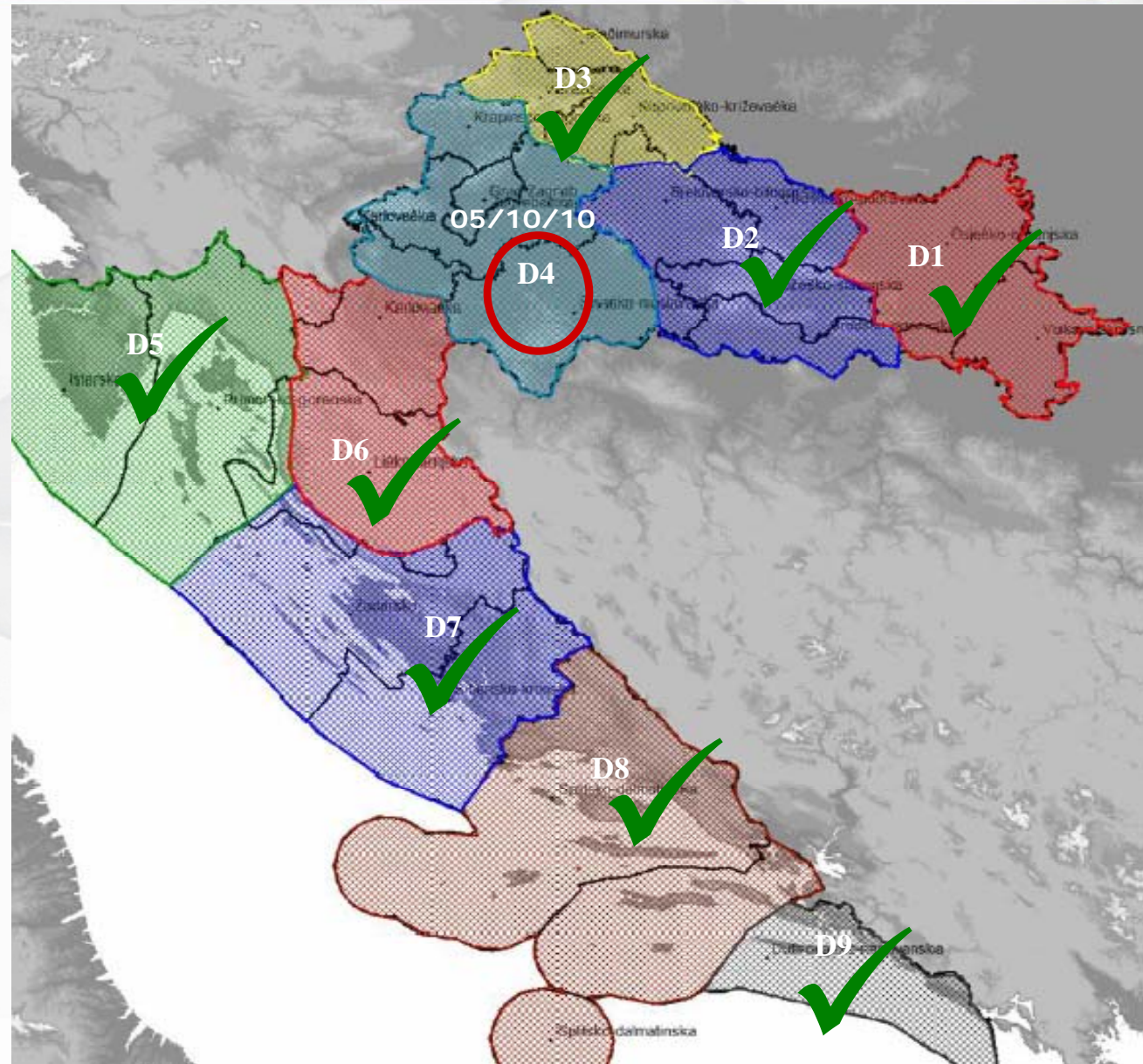


## Analogue to Digital Television Switchover in Croatia

- 19 May 2010 HAKOM started tendering procedure for granting the individual rights for the use of radiofrequency spectrum for providing electronic communication service managing DTV broadcasting national/regional and local networks ( MUX D)
  - license duration 10 years
  - required network coverage of 70% population of each region (allotment)
  - minimum coverage of the existing analogue regional and local programs
  - MPEG-2, min. 5 (3+2) SDTV programs on national/regional and min. 2/3 SDTV programs on local level
  - to ensure multiplexing service
  - must carry obligation for existing analogue programs
- documentation was available in electronic format at the HAKOM's web site and in paper on request
- 21 July 2010 Decision on granting the license to Odašiljači i veze d.o.o.
  - network coverage >90% population of Croatia

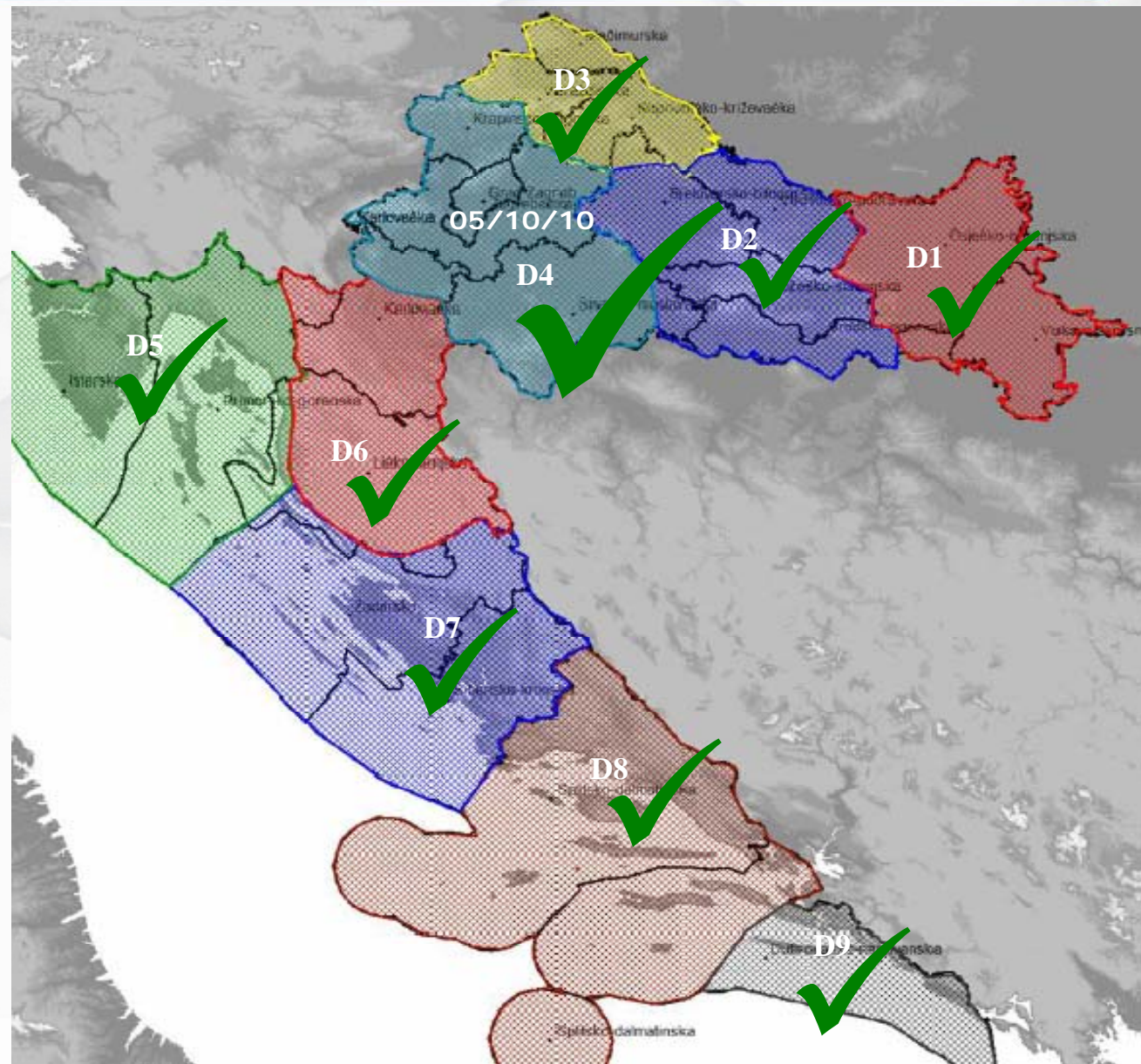
# Analogue to Digital Television Switchover in Croatia

Digital region	ASO
D5	26th January, 2010
D3	3rd March, 2010
D7	30th March, 2010
D9	27th April, 2010
D1	25th May, 2010
D2	29th June, 2010
D6	20th July, 2010
D8	7th September, 2010
D4	5th October, 2010



# Analogue to Digital Television Switchover in Croatia

Digital region	ASO
D5	26th January, 2010
D3	3rd March, 2010
D7	30th March, 2010
D9	27th April, 2010
D1	25th May, 2010
D2	29th June, 2010
D6	20th July, 2010
D8	7th September, 2010
D4	5th October, 2010



# Analogue to Digital Television Switchover in Croatia

- Promotional and informational campagne (Central State Administrative Office for e-Croatia)
- on national and regional (local) level
- communication channels:
  - brochure
  - web site ([www.vlada.hr/dtv](http://www.vlada.hr/dtv))
  - call center 0800 1 1 2011
  - TV video
  - crawl text on the TV screen
  - press release
  - DTV ambassadors



- **100% awareness of the switchover process**
- **97% penetration of digital receiver equipment**

# Analogue to Digital Television Switchover in Croatia

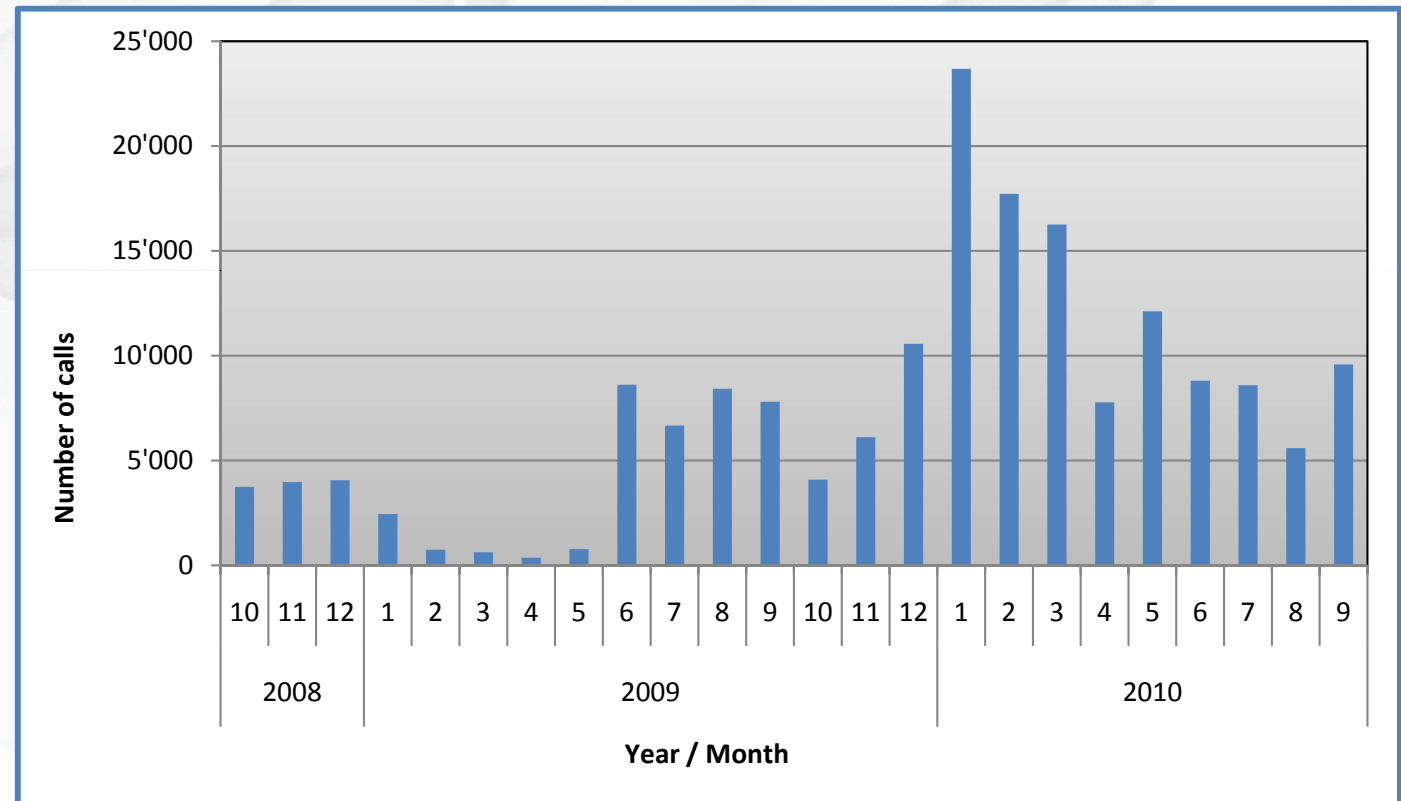
- call center of the Government of the Republic of Croatia, operated by OIV Ltd.

Year / Month	Number of calls
<b>2008</b>	<b>11.762</b>
10	3.739
11	3.971
12	4.052
<b>2009</b>	<b>57.180</b>
1	2.446
2	740
3	620
4	356
5	770
6	8.607
7	6.663
8	8.421
9	7.802
10	4.082
11	6.109
12	10.564
<b>2010</b>	<b>110.099</b>
1	23.681
2	17.721
3	16.249
4	7.772
5	12.114
6	8.804
7	8.590
8	5.586
9	9.582
<b>Grand Total</b>	<b>179.041</b>



**0800 1 1 2011**

[www.vlada.hr/dtv](http://www.vlada.hr/dtv)



Information provided by OIV Ltd.



# Digital Television in Croatia

## 2002 → 2011

- First DVB-T transmission in Croatia started 2002 in the area of Zagreb
- Pilot-project “Digital Istria”, September 2007
  - DVB-T coverage, prediction vs. measurements
  - building SFN/MFN network
  - achieving high coverage of the population
  - Government of the Republic of Croatia subsidised digital receivers (technologically neutral)

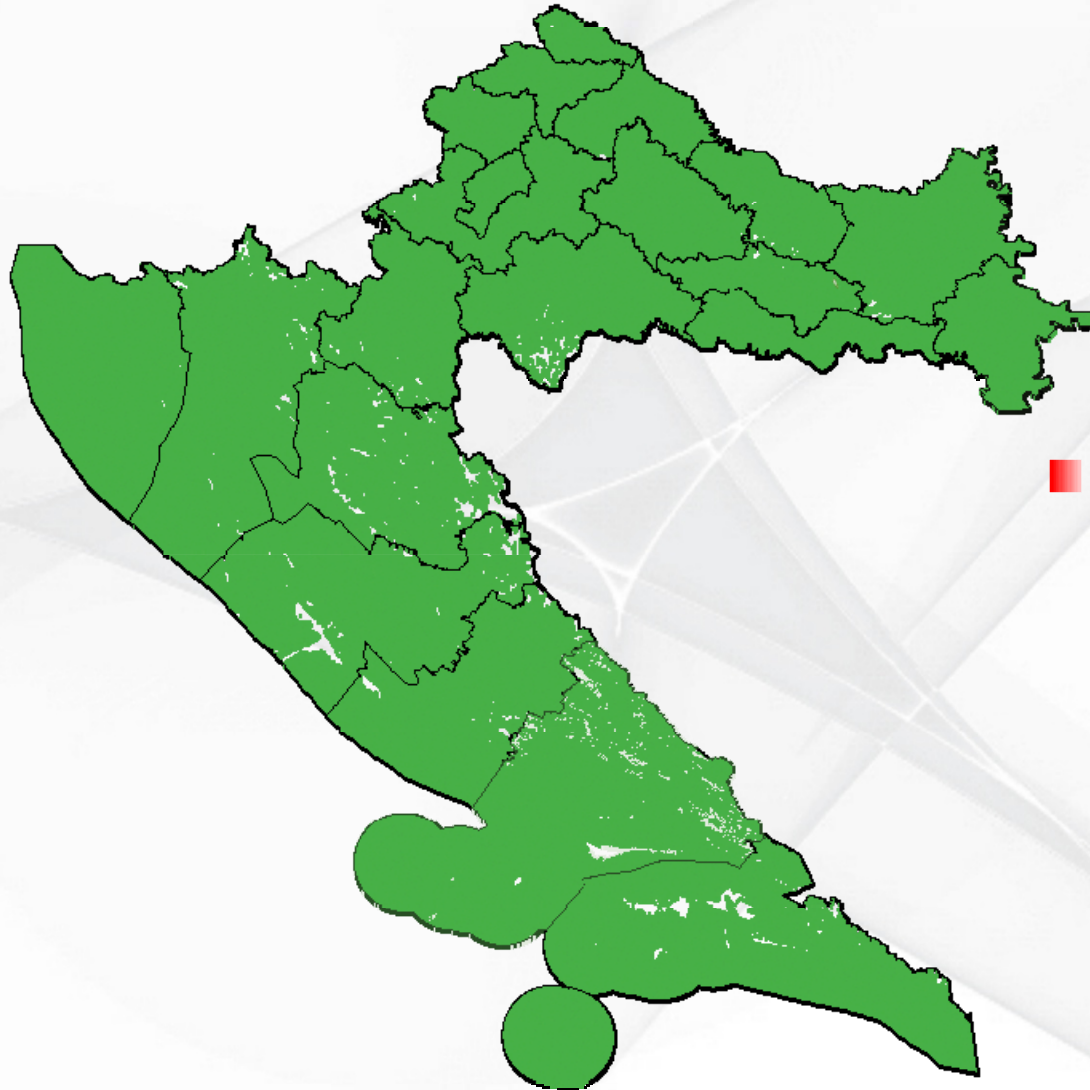


 ISTRAdigital

# Digital Television in Croatia

## 2002 → 2011

■ MUX A in operation, >98% population coverage



■ 212 transmitters

# Digital Television in Croatia

## 2002 → 2011

■ MUX B in operation, >95% population coverage



■ 108 transmitters

# Digital Television in Croatia

## 2002 → 2011

- MUX D is building up, partly in operation
- full operation, >90% population coverage

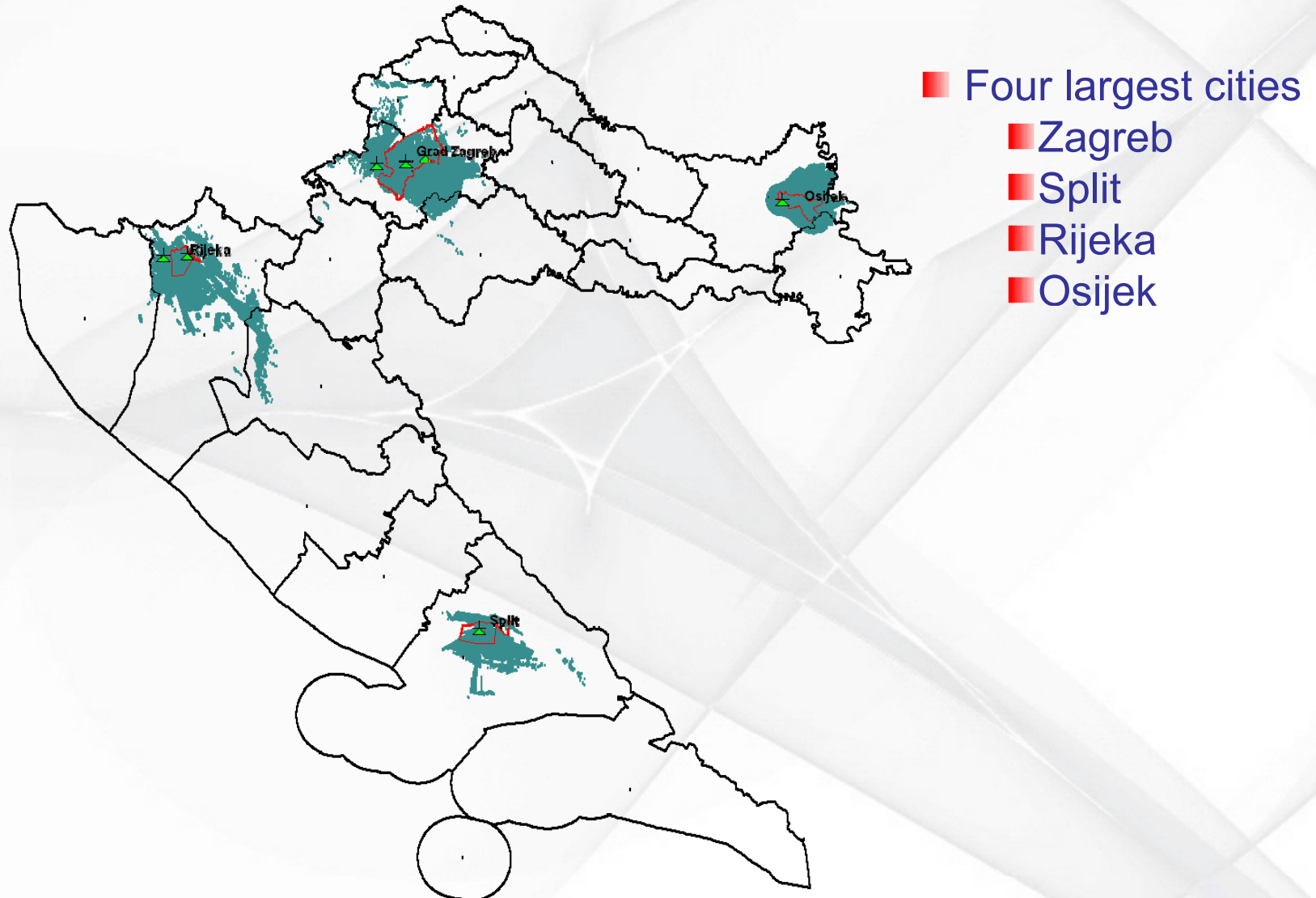


■ 23+13 transmitters

# Digital Television in Croatia

## 2002 → 2011

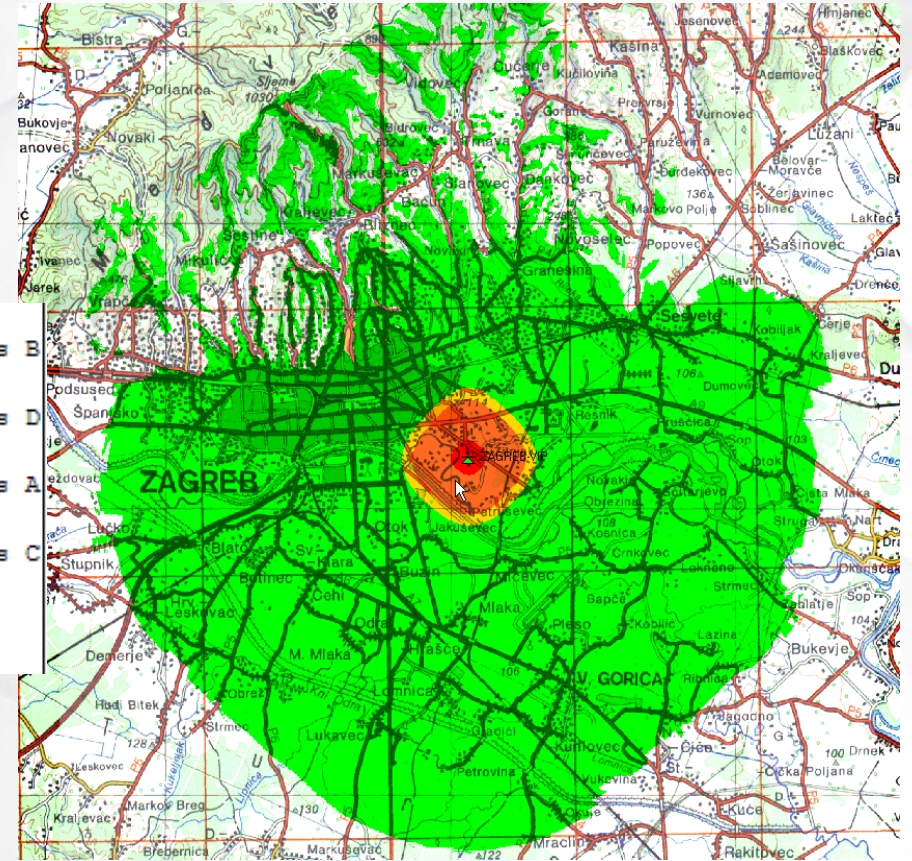
■ HDTV in test operation (DVB-T/ MPEG-4 Part 10)



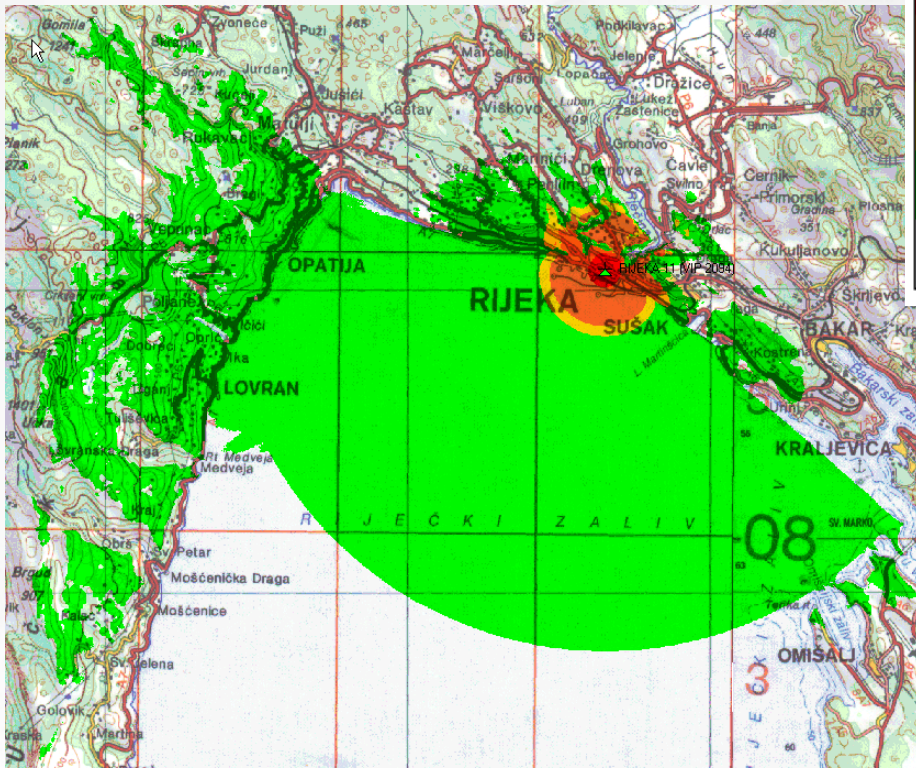
# Digital Television in Croatia 2002 → 2011

## DVB-H test operation in 2009

### Zagreb



### Rijeka

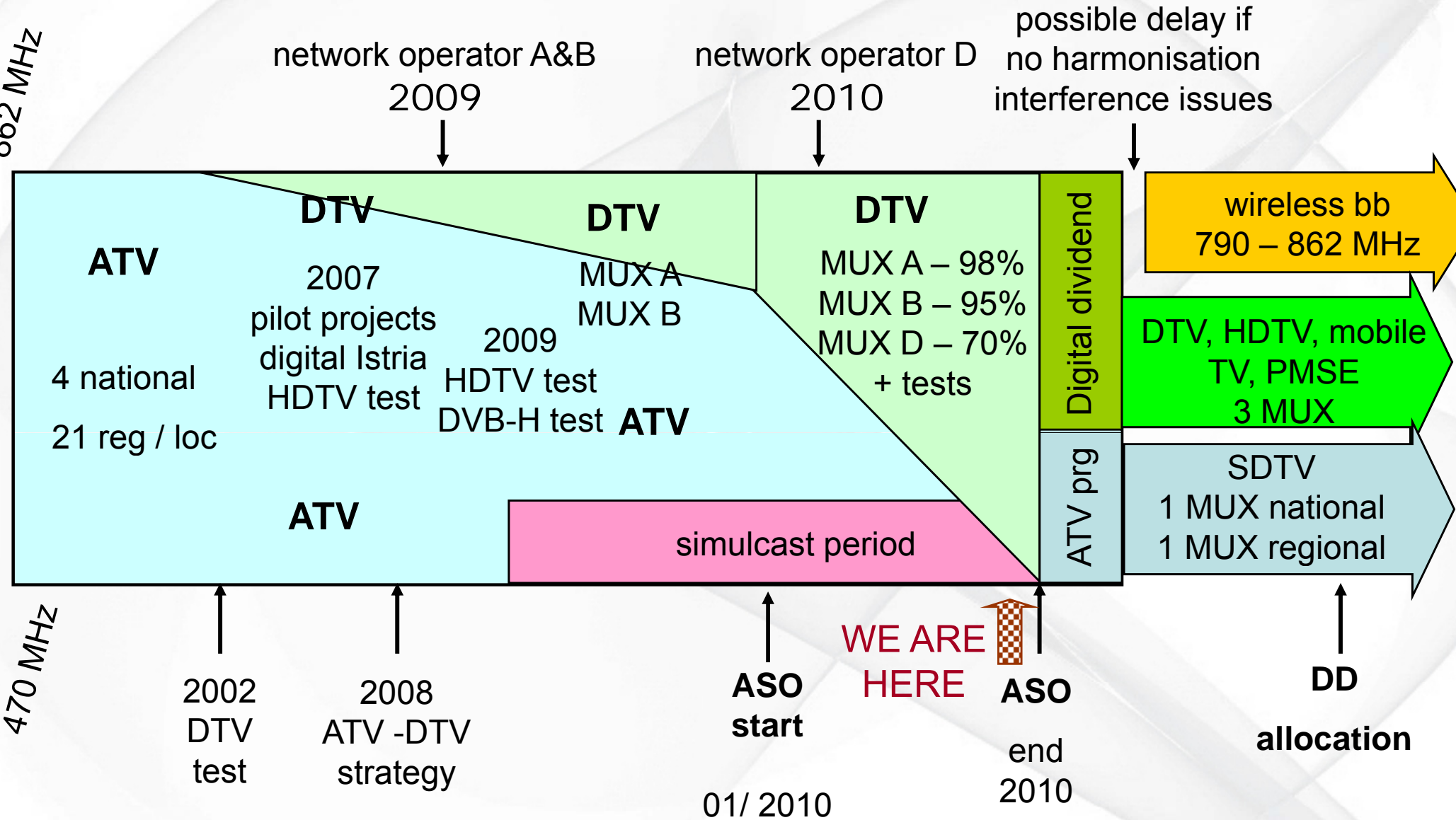




# Croatian DTV roadmap reaching ASO

862 MHz

470 MHz





**No official decision has been made –HAKOM’s view in presentation;**

*790 – 862 MHz – HRV ATV ->DTV Strategy (2008.)*

kanal	21	55	56	60	61	69	70
frekvencija	470MHz		750MHz		790MHz		860MHz
usluga	DVB-T/H		DVB-T		IMT		

**2009 - Croatia amended legislation - possible use of digital dividend for IMT;**

*790 – 862 MHz in Frequency Allocation Table*

<b>790-862 MHz</b>					
RADIODIFUZIJA	civ.	TV/DTV	GE06	TV UHF pojas V (582-862 MHz)	Na zahtjev/Natječaj/Javna dražba
POKRETN 5.316		Radiomikrofon	ERC/REC 70-03		Na zahtjev
		<b>IMT</b>	<b>ECC/DEC/(09)03</b>		<b>Javna dražba</b>





- FAT – 790-862 MHz is going to be allocated on a public auction;
- model of auction not yet determined;
- technology neutral approach;

790 – 862 MHz Possible frequency arrangement (according to CEPT Report 31)

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					
1 MHz	30 MHz (6 blocks of 5 MHz)						11 MHz	30 MHz (6 blocks of 5 MHz)					



- public consultation on digital dividend in 2011;
- frequency coordination, multilateral agreements with neighbouring countries;
- depending on the consultation results and neighbours actions  
– auction in 2012 or later;
- auction format and minimum price need to be determined;
- auction for bundled access (800 MHz and 2.6 GHz) possible;
- at current stage, operators do not push the procedure;



## Countries in the region

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### ■ Austria

- DTT launched in October 2006, ASO ends in the beginning of 2011;
- 2 national DVB-T multiplexes, 1 regional DVB-T multiplex (16 licenses), 1 DVB-H multiplex;
- MPEG-2 for DVB-T, MPEG-4 for DVB-H, DVB-T2 trials announced;
- DVB-T FTA, DVB-H pay-tv;
- Government decided to use the spectrum 790-862 MHz in the future for mobile communication systems;
- Dividend to be allocated: end of 2011-beginning of 2012;

### ■ Hungary

- DTT launched in December 2008, ASO 31/12/2011;
- 1 license issued for 5 DTT multiplexes, 3 multiplexes available immediately, 2 available after ASO (2012);
- DVB-H available in Budapest
- Local and regional DTT multiplex to be licensed
- MPEG-4 AVC
- FTA and PAY TV content in MUXes
- DTT ch >60 in operation, 800MHz band released after ASO



### ■ Italy

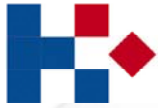
- DVB-T, DVB-T2, MPEG-2, MPEG-4 AVC
- FTA and PAY TV content in MUXes;
- ASO announced for the end of 2011;
- Digital dividend – mobile use?

### ■ Slovenia

- Experimental DVB-T launched in 2001 (MPEG-2), MUX A launched in November 2007, ASO by the end of 2010;
- 2 national DVB-T multiplexes, local DVB-T multiplexes (10 licenses);
- MPEG-4 AVC;
- DVB-T FTA;
- DTT ch>60 in operation, to be released;
- Digital dividend available after ASO;

### ■ Bosnia and Herzegovina

- DTT has not been launched, ASO scheduled for 31/12/2011;
- MPEG-4 AVC;
- No information on digital dividend



## Countries in the region

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### ■ Montenegro

- DTT has not been launched, ASO scheduled for 31/12/2011;
- MPEG-4 AVC;
- No information on digital dividend

### ■ Serbia

- Experimental DTT launched in 2005. DVB-T2 launch and ASO are announced for 4/4/2012
- No licenses issued for DVB-T2;
- No information on digital dividend



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Thank you for your attention...

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[www.hakom.hr](http://www.hakom.hr)