

# RRC-06 and Digital Dividend

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# RRC-06 and Digital Dividend



RRC-06 and GE06 Agreement  
Digital Dividend  
Mobile Broadcast in Europe  
Conclusions

# Overview of the GE06 Agreement Planning Area and Plan Entries in GE06



## Digital Plan

Digital Audio: T-DAB  
Digital TV: DVB-T  
Reception: roof-top  
portable  
mobile

Band III (174 – 230 MHz)  
T-DAB: 8379 plan entries  
DVB-T: 6703 plan entries

Band IV/V (470 – 862 MHz)  
DVB-T: 55409 plan entries

## Planning Area



# Overview of the GE06 Agreement Agreement and Frequency Plan



## Frequency Plan

Analogue TV

Former analogue  
TV Plan (ST61)

Digital broadcasting

Planning process

List of other  
services

Existing stations  
having right of  
protection

## Agreement

Article 4

Modification and  
addition of plan  
entries

Article 5

Flexible use of plan  
entries (future  
proof)

Transition

Analogue until 2015  
2020 for Band III in some  
non European countries

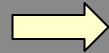
## Spectrum Dividend: EU-COM on RRC-06 (Sep 2005)

The spectrum dividend is understood as the spectrum made available over and above that required to accommodate the existing services in a new, more efficient form by applying new transmission and coding techniques

## Example: Digital Dividend of RRC-06

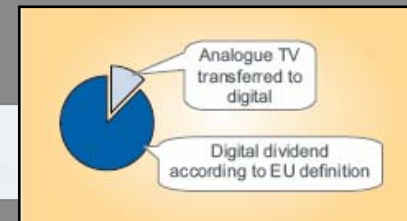
Transition from Analogue TV to DTTV (DVB-T), finished by 2015 (EU: 2012)

Analogue TV Plan (ST61):  
3 - 6 nationwide coverage layers



Can be accommodated in 1 - 2 DVB-T MUX:  
7 - 14 channels in new Digital Plan (GE06)

According to EU definition: 75 - 80% dividend



## Future Example: UMTS Dividend

Phase out of GSM and  
Spectrum savings by using more efficient techniques in IMT2000

# Digital Dividend Options for implementation



## EC Categories

## Options for implementation

### Improved terrestrial broadcasting services

higher quality, more programmes  
enhancement of TV experience...

Operating under GE06  
plan entry

### Converged broadcasting services

“hybrids” of traditional broadcasting  
and mobile multimedia...

GE06 Article 4 plan  
modification and/or  
re-planning of  
DVB-T in parts of the band

### New and future uses

**non- broadcasting family**  
extension of 3G, short range  
applications...

New allocation in Article 5  
of Radio Regulations

# Digital Dividend in Europe



## Identifying fixed amount of spectrum as the digital dividend

- e.g. UK

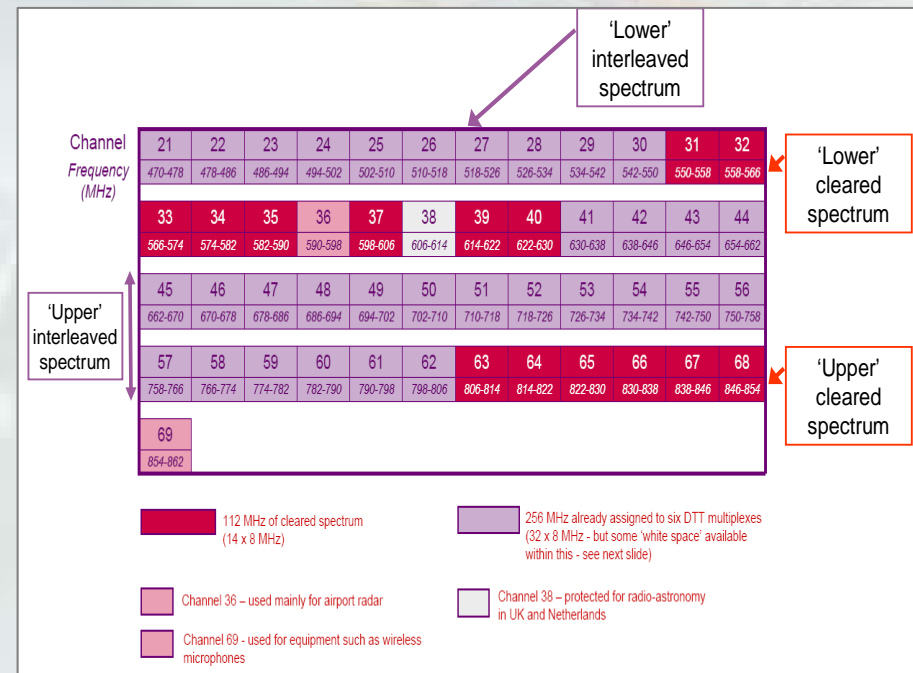
## Aiming at harmonized sub-band for mobile services (IMT2000)

- e.g. France, Sweden, ...

## Licensing broadcast and mobile broadcast in most/all part of the UHF

- e.g. Germany

## Waiting for development of next year(s)



## EC: strong view in favour of mobile services in harmonized UHF

## Digital Dividend in the UK

# Digital Dividend Broadcasting Applications



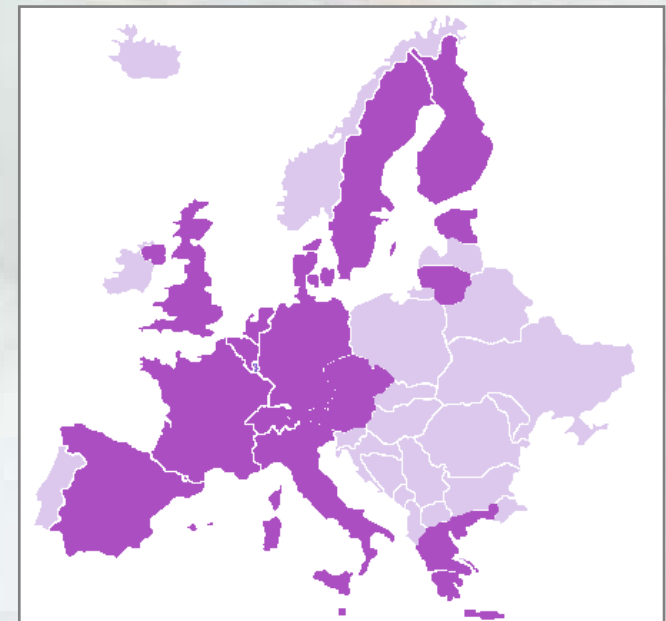
## Extension of number of programmes, DVB-T services already in operation:

- 2 to 6 multiplexes (10 – 25 programmes)
- full area or population centre coverage
  - in many cases for roof-top or mobile/portable reception
  - in some cases for indoor reception

## Extension of number of programmes and of reception quality generally intended

## Extension of picture quality (HDTV) intended in medium terms

- Discussion started in several European countries
  - UK, Ireland, France, ...
- MPEG2 -> MPEG4



## Regarded as essential for digital terrestrial broadcasting and ...

... easy to implement, since GE06 Plan is made for this purpose



# Digital Dividend Mobile Broadcast Applications



## Mobile Broadcast:

- Converged broadcasting services, primarily „hybrids“ of traditional broadcast and mobile communication services

## Several systems available

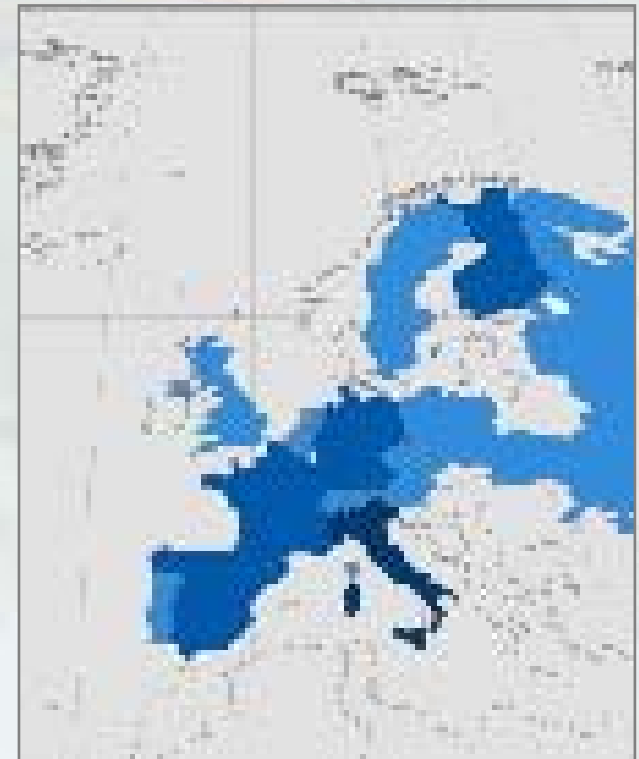
- DVB-H, DMB, MediaFLO

## Operational Services already launched

- Italy: DVB-H in UHF
- (Germany: DMB in L-Band)

... or soon to come

- Interleaved sharing with DVB-T / T-DAB possible



### Example: DVB-H in Europe

- service launched
- service launch expected soon
- tests/trials

(from DiGiTAG website)

## SAB/SAP

- Ancillary Services in Broadcasting and Production  
(Professional Wireless Microphone Systems, Electronic News Gathering, etc.)
- Interleaved or harmonized sharing possible

## IMT2000 and beyond

- EU and CEPT activities searching for a harmonized sub-band in GE06-UHF band
- EU-COM on WRC-07: primary allocation to mobile services in UHF  
CEPT Report B: Sub-band harmonization for at least 64 MHz, on a national basis
- No (interleaved) sharing possible

## Other applications

- WIMAX
- Other short range radio applications

## Envelope Concept

- *GE06 Art. 5.1.3*

*A digital entry in the Plan may also be notified with characteristics different from those appearing in the Plan, for transmissions in the broadcasting service or in other primary terrestrial services operating in conformity with the Radio Regulations, provided that the peak power density in any 4 kHz of the above-mentioned notified assignments shall not exceed the spectral power density in the same 4 kHz of the digital entry in the Plan. Such use shall not claim more protection than that afforded to the above-mentioned digital entry.*

## Application to Mobile Broadcast systems

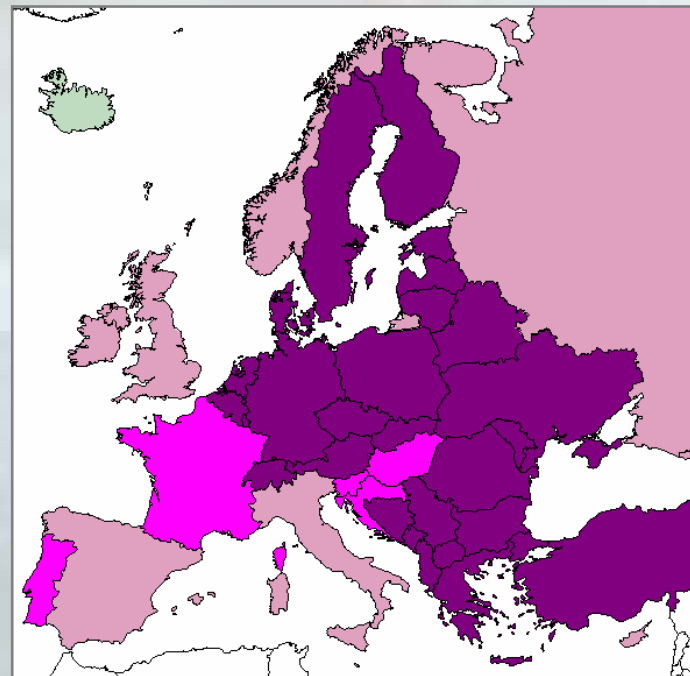
- **Technically:** No problem, similar/identical technologies for DVB-H & DMB even the same system families
- **Regulatory (ITU-R RR):** No problem, since regarded as broadcasting

## Characteristics of GE06 plan entry

RPC1 (roof-top)	RPC2 (mobile)	RPC3 (indoor)
Not suitable	May suit provisions needed	Well suitable

If GE06 plan entry not suitable:  
Use Art.4 for modification  
(and talk to your neighbours)

# CEPT countries Reception modes for UHF DVB-T in GE06



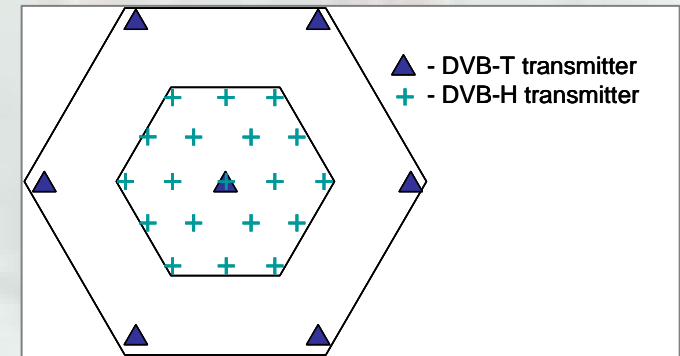
- Portable
- Rooftop or Portable
- Rooftop

# Sharing aspects with Mobile Broadcast



## Adjacent channel issue

- DVB-T/H reception sensitive to interference in vicinity of adjacent channel transmitters
- Adjacent channel case not excluded in GE06 frequency planning
- Assumption: Administration and network operators provide for that case



## Mobile Broadcast

- Possible scenario: different network structures for Mobile Broadcast and DTTV
- CEPT TG4/Report A:
  - mitigation techniques available (frequency & network planning)
  - on national basis also harmonization possible
  - both approaches not exclusive

## Conclusion: interleaved sharing possible

# Example: Mobile Broadcast in Germany



## DVB-H in UHF

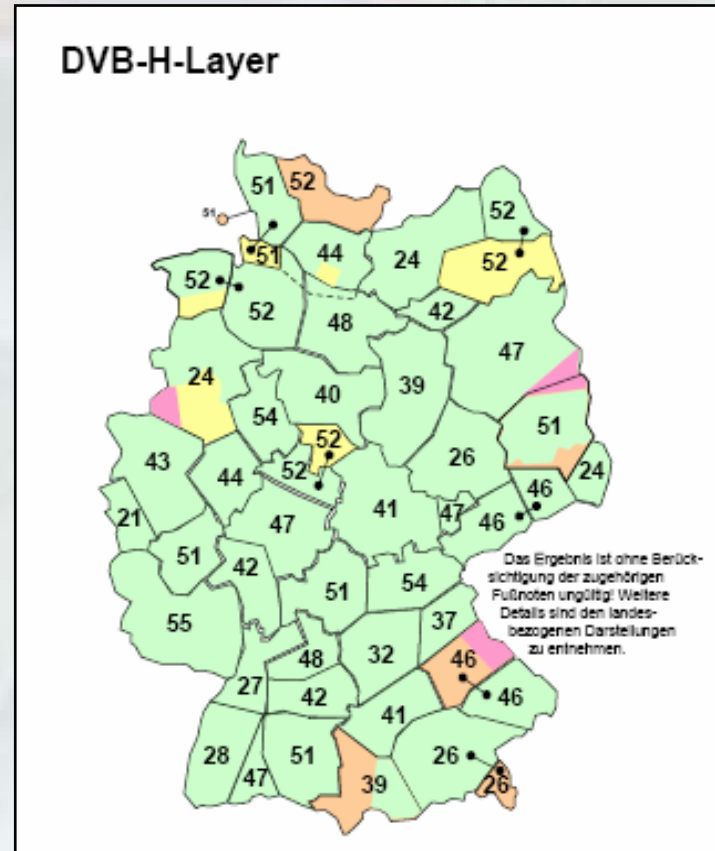
Operational service for indoor reception based on broadcast-like networks

Start:	Medium term:	Long term:
Now (2Q 08)	end 2008	10 years
Hannover	16 main cities	all cities > 150.000
Preferably:	20% population	70% population

## DAB/DMB in VHF

7 nationwide coverages for indoor reception  
 1 metropolitan area coverage (indoor reception)  
 Choice of DAB/DAB+/DMB services open  
 Roll-out from now until 2012  
 (1 operational DMB service in L-band, 2006)

## Tentative DVB-H layer in Germany



- GE06
- other non-GE06 (yet to be co-ordinated)

## Analogue switch-off / Digital Dividend

- in some countries already finished, several others follow soon, within 4 years in all EU (hopefully)
- Spectrum available in Band III, Band IV/V, (L-Band) for Mobile Broadcast (amount varies from country to country)

## GE06 Agreement & Plan

- provides appropriate regulatory framework for introduction of Mobile Broadcast
- plan entries for mobile/portable reception are adequate for Mobile Broadcast
  - DVB-T  $\Rightarrow$  7 / 8 MHz systems in Band III and IV/V
  - T-DAB  $\Rightarrow$  1.75 MHz systems in Band III
- transformation of plan entries for fixed reception for Mobile Broadcast via GE06 Art. 4
- countries with DVB-T services for fixed reception should apply mitigation techniques for interleaved spectrum usage with Mobile Broadcast (or harmonize on a national basis)

## As a Mobile Broadcast proponent:

- Make sure that the required spectrum is really available
- Start planning and/or implementation of operational services today

# RRC-06 and Digital Dividend



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## Thank you for your Attention

... and thanks to Nigel Laflin (BBC) for leaving slides of his presentation on Digital Dividend

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