



DIGITAL TERRESTRIAL TV TRANSITION

GERMAN EXPERIENCE

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Guideline for the presentation

- Basic elements of relevance for the transition are outlined
- By this, many different starting situations are covered
(Projection to individual situations per country possible)
- Possible conclusions are presented
- Examples are given referring to the German situation and transition path

DVB-T supply in Germany

- Area: about 357.000 skm (138.000 sqm)
- Population: about 82 million people
- Switch-over finalised by Nov. 08
- Programme configuration varies from region to region
- Public broadcasters provide for about 95 % of the population (analogue: about 98%)
- Private broadcasters provide service in densely populated areas only

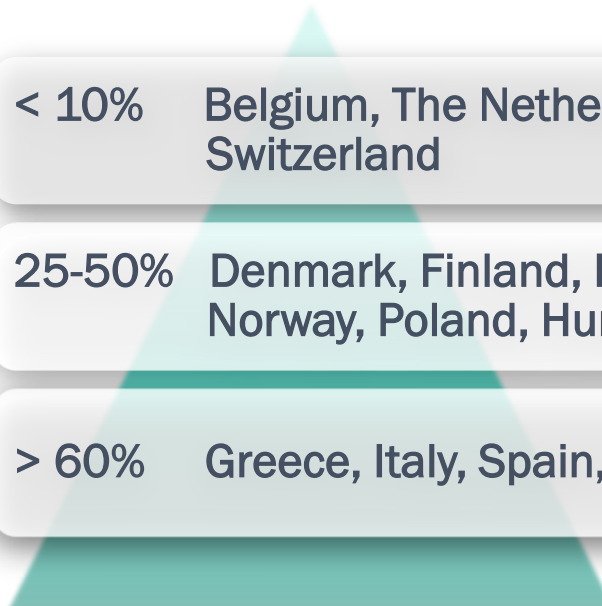


source:
www.ueberallfernsehen.de

Basic characteristics for a transition (1)

Different relevance of terrestrial provision of broadcasting in different countries

- Mentionable differences in terms of the *primary* terrestrial service (i. e. the provision for the main TV set in a household)

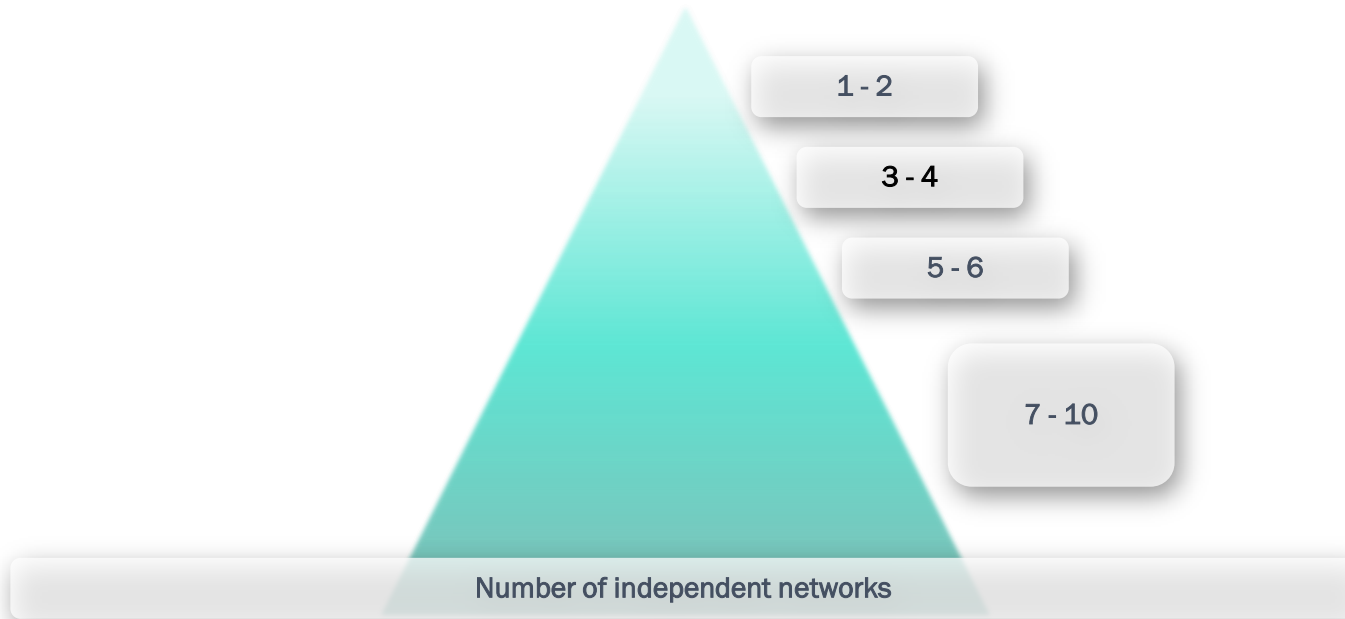


< 10%	Belgium, The Netherlands, Austria Switzerland
25-50%	Denmark, Finland, France, Ireland, Norway, Poland, Hungary, Sweden
> 60%	Greece, Italy, Spain, Czech Republic, UK

Consequence

Differences in terms of quality and of quantity of the Digital Dividend have to be considered

Basic characteristics for a transition (2)



- Capacity claim is caused by number of programmes, NOT by percentage of provision!
- “Regulatory” impact!

Basic characteristics for a transition (3)

Percentage of terrestrial reception (ii)

- Competitive situation
 - ❖ Percentages for
 - Satellite distribution (Germany about 40% in 2002)
 - Cable distribution incl. VDSL (2002: about 55%)
- Distribution costs for 5 % much higher than for 95 %
- Political decision: alternative costs / different spectrum usage

Rule of thumb:

The lower the percentage of terrestrial reception, the easier the switch-over ... and a terrestrial network the less needed

Basic characteristics for a transition (4)

Receivers

- Receiver types:
 - Built-in
 - Set-top box
 - USB
- Prices from 10 € (USB) to about 80 € (set-top box with PVR functionality); TV sets from 200 € (26" to 32") include a built-in receiver
- End of 2002 (Germany DVB-T launch): prices from 200 € to 400 € per set-top box w/o PVR
- Sufficient variety of affordable receivers is crucial!

Basic characteristics for a transition (5)

Number of programmes

- Aspect 1: the demand of the recipient
 - 10 programmes may cover 95% of the consumption of 1 recipient
 - 30 programmes may cover 95% of the consumption of 95% of the recipients
- Aspect 2: the supply by the providers
 - How many programmes are to be transmitted?
 - How many networks can be paid for?
- German approach: up to 7 networks times 4 programmes in the most common operational mode, depending on regions/cities
- More is possible, depending on individual accessibility demands, even with less resources (e. g. by different operational modes)

Basic characteristics for a transition (6)

Structures of programme provision

- Nationwide programmes in Germany:
 - full-time: only 1 bouquet (4 programmes) (nationwide public provider)
 - part-time: regional public providers have some programmes in common
- Regional programmes in Germany
 - federal states-wide provision by regional public providers AND by nationwide private providers being forced to also provide for regional content for some time a day („programme window“)

Kanal Frequenz	example of Rhein-Main Area			
SENDER GROSSER FELDBERG (TS.), FERNMEDELDETURM FRANKFURT UND HOHE WURZEL (WIESBADEN)				
37 602 MHz	Das Erste®	hrfernsehen	arte extra®	
8 198,5 MHz	phoenix	BR BAYERISCHES FERNSEHEN	SWR FERNSEHEN SWR RP	
22 482 MHz	ZDF	K&K zdf neo	Bsat	ZDFinfokanal
34 578 MHz	RTL	VOX	RTL	SUPER RTL
54 738 MHz	7	SAT.1	N24	kabeleins
52 722 MHz	TELE 5	QVC	CHANNEL 21 mediacenter	bibel.tv

Structure of programme provision delivering options for a switch-over strategy in countries with a large territory

Germany : “island” by “island”, per “island” commonly by public and private providers

Basic characteristics for a transition (7)

Structures of programme provision (ii)

- National structure:
 - Primary terrestrial distribution: homogeneous - or not?
 - E. g. rural areas up to 3%, urban areas up to 30% in D
- Number of programmes per sub-region/city
 - Germany: depending on density of population
 - Rural areas: regional public providers present upcoming interest for local provision even in smaller towns
 - Large cities: commercial interest of private providers given
 - Result for Germany:
 - Rural areas: at least 3 networks times 4 programmes
 - Cities: up to 7 networks times 4 programmes operational



Strategical aspects

- The most important first: Communication
- Simulcast – *yes or no* ?
- Transition – nationwide or step by step
- Institutions to be established



Strategical aspects (1)

Communications

- Positive experience by:
 - e. g. in Berlin 1 million letters sent to households
 - official web-site(s) (regional AND over-all)
 - flyers
 - announcements on TV and radio
 - citizen assemblies in towns and villages
 - information also to cable network operators
 - ...

Strategical aspects (2)

“Rules” from experience:

- Information to everyone
(Manufacturers, importer, whole-salers, retailers, TV network providers, recipients)
- Sequential order to be maintained
 - ❖ Stakeholders and experts first
 - ❖ Recipients last
- Appropriate timeframe to be maintained
 - ❖ Recipients not too early, otherwise they lose interest (9 – 18 months), AND
 - ❖ Recipients also not too late, otherwise more time, money and resources needed
 - ❖ Stakeholders and experts about 6 to 12 months in advance of recipients

Strategical aspects (3)

Simulcast

- „Rules“
 - The higher the percentage of primary reception, the higher the political claim for a long simulcast period
 - The longer the simulcast period, the higher the costs
 - The longer the simulcast period, the higher the demand for frequencies and other resources
- “But: The better the transition is prepared in advance, the lower the real need for a (long) simulcast period
- Conclusion
Try to avoid (long) simulcast periods!!!

Strategical aspects (3)

Simulcast (ii)

➤ Experience:

- First phase of transition (not too much experience in advance AND short period of communication): simulcast in Berlin 9 months, in Northrhine-Westphalia 6 months
- Second phase of transition: even in Berlin no more than 6 months, no simulcast elsewhere
- Third phase: Berlin and others: no simulcast at all !

Strategical aspects (4)

Simulcast (iii)

➤ Is simulcast needed?:

- 1. Assumption: reasonable timeframe for communication towards the recipients, e. g. 9-12 months in advance (T)
- 2. Market dynamics (number of sold receivers per time unit), e. g. 10-12 million per year in Germany, to be seen per region (MD)
- 3. Number of households, which really need to be equipped with a new receiver, to be seen per region (HH)
- 4. A constant factor C, to implement certainty, e. g. $C = 2$

➤ “Formula”

Find the relation of MD (T / C) to HH and decide, whether simulcast is really needed

Strategical aspects (5)

Transition extension

➤ Questions and their background

➤ Area of the country

The larger the area, the greater the logistical challenge to roll-out and extend networks

Therefore:

larger areas ⇔ longer roll-out period ⇔ stepwise roll-out

➤ Structure of population density

Are there “islands” (i. e. capital/large cities, densely populated areas), in which the roll-out could be started, before touching “outer space” ?

But: avoid “digital divide” in broadcasting !

Strategical aspects (6)

Transition extension (ii)

- German experience
 - DVB-T launched in Berlin 01/11/2002
(all in all 5 million potential recipients with about 25 % of primary terrestrial reception; Berlin first region worldwide w/o analogue TV)
 - “Islands” like Hamburg, Munich, Cologne followed step by step
 - Experience was transferred from “islands” launched earlier



Strategical aspects (7)

Institutions

- Main tasks
 - Project management
 - Communications
- Institutions needed
 - Project office (per “island”!)
 - Over-all guidance to fit in regional projects
- German experience
 - Governmental Initiative Group + Regional project offices

Technical aspects (1)

Network topology

- High tower, high power versus low tower, low power network topology
 - What type of service will the network transport on the middle or the long run ?
 - How many networks have to be operated in parallel, e. g. if simulcast is intended (frequency resources aspect) ?
 - Would there be a return of invest for any kind of dense networks ?

German approach:

High tower, high power – broadcast only ☹

Technical aspects (2)

E. g. DVB-T/MPEG-2 versus DVB-T/MPEG-4 versus DVB-T2/MPEG-2 versus DVB-T2/HEVC

- When will the service be launched ?
 - ⇒ Availability of inexpensive / affordable receivers !
- Which type and which technical quality of service will be offered ?
 - ⇒ Can capacity needed be provided by a suitable number of networks (e. g. HDTV/fixed reception or mobile service also, on little displays ?
- Is it intended to integrate different broadcasting services in the same network(s) ?
 - ⇒ e. g. common strategy for TV and sound broadcasting
- Are scalable network areas needed ?
 - ⇒ allotment extensions are feasible with DVB-T2

Rule of thumb:

Better start with the most up-to-date system, for which affordable receivers are available

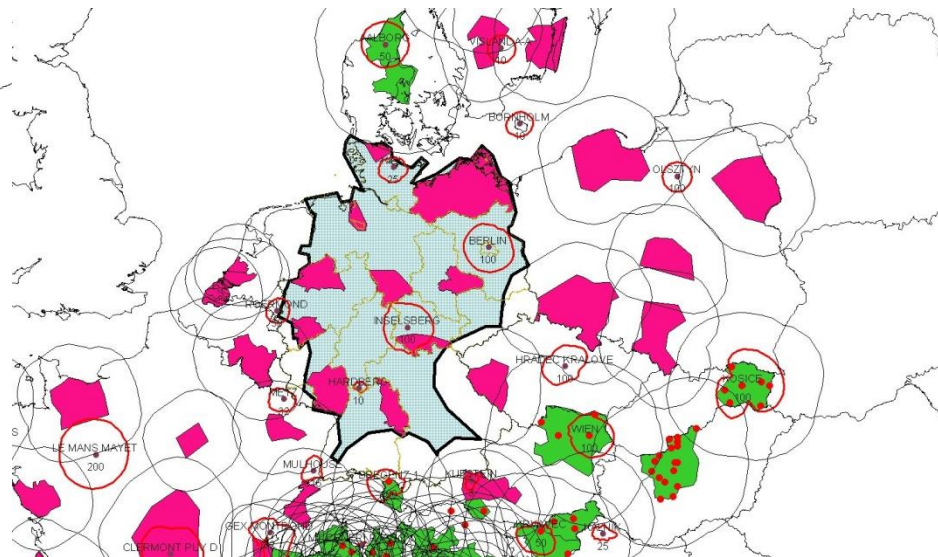
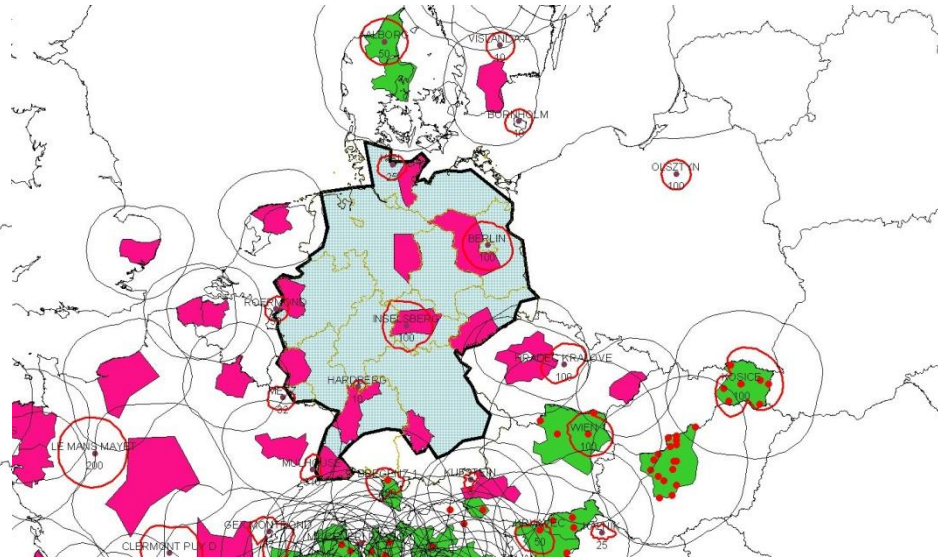
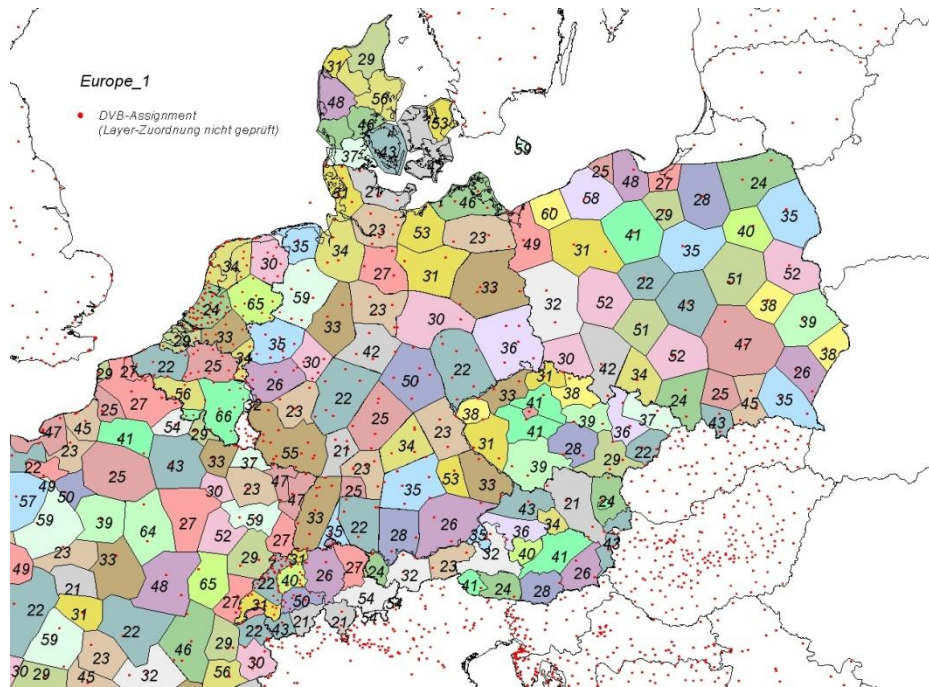
Technical aspects (3)

- German choice
 - Transition from 2002 to 2008: only DVB-T available
 - Low percentage of primary terrestrial reception, return of invest uncertain
 - ⇒ “cheap” networks needed = existing ones with high power, high tower stations
 - Only MPEG-2 available
- Conclusion
 - Transition necessary for all aspects mentioned !!!

Aspects of frequency resources (1)

- Starting point: GE-06
 - Binding for administrations versus administrations only, but not for administration versus operator
⇒ should not be taken as final roll-out plan !!!
 - Outer “envelope” of thresholds decisive, not inner positioning of allotments
 - Conclusion: capacity may be augmented
- Amendments by implementation of Digital Dividend !
 - Use of digital dividend to be harmonised
 - Participation in economies of scale for any other country possible if going the same way

Aspects of frequency resources (2)



Gains and benefits

Examples!!!

- More broadcasting for the recipient
 - 3 nationwide networks DVB-T (public broadcasters)
 - up to 4 additional networks region-wise/cities (private broadcasters)
 - ⇒ 12 to 30 programmes instead of 3 to 7
- Added value within broadcasting
 - introduction of DVB-T2
including plans for HDTV for some programmes
- Nationwide provision of 4 programmes
 - 85 main transmitters, no gap filler (about 93 % of population)
 - comparison: 104 main transmitters + >2,000 gap fillers
for 1 programme (about 98 % of population)
- **Digital Dividend enabled!**

“Assessment”

- Digital switch-over (as well as digital dividend) are both necessary steps towards future provision of services for recipients
- Digital switch-over is a necessary step for the future provision of broadcasting as well as for enabling a digital dividend.
- Digital switch-over as well as digital dividend must not be treated as static. Scarcity of spectrum, quantity of traffic and type of customer demands will force the integration of services as well as new approaches for awarding resources .
- **Conclusion:**
These steps are necessary, but work doesn't end once they are done!

Introduction of DVB-T2/HEVC in Germany (1)

- The proof: Introduction of DVB-T2/HEVC in Germany
- Starting point: spring 2016
 - Two bouquets
 - HEVC-coded (h.265)
 - About 35 sites all over Germany
 - Main programmes of public providers “on board”
- Transition completed: by middle of 2019 at latest
 - Public providers: three nationwide multiplexes
 - Private providers focus on densely populated areas
 - Some local bouquets also

Introduction of DVB-T2/HEVC in Germany (2)

- Re-channelling of transmitters to frequencies below 694 MHz when switched over to DVB-T2
- Updated estimation: more than 250 transmitters involved
- Co-ordination without the need for a “planning conference”
- Regional groups (WEDDIP, NEDDIF) structure re-planning in their own capacity
- Different starting points and schedules to be taken into account
- Political decisions towards a common aim not yet taken!
- But partnership already works!



**THANK YOU VERY MUCH
FOR YOUR ATTENTION!**

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