



On the Future DVB Terrestrial

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Our Mission: To Create And To Promote Video Standards



ATSC



DVB



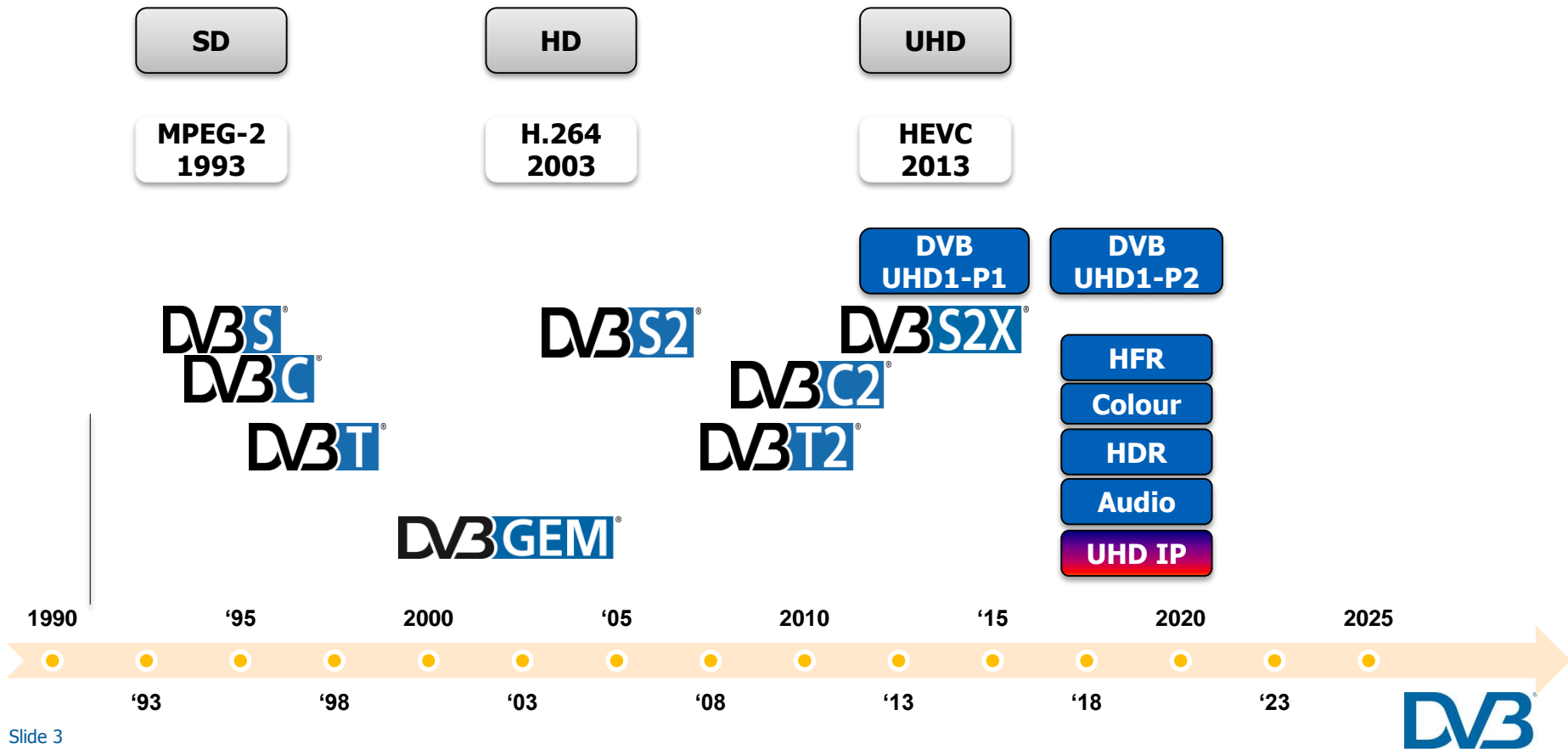
ISDB-T



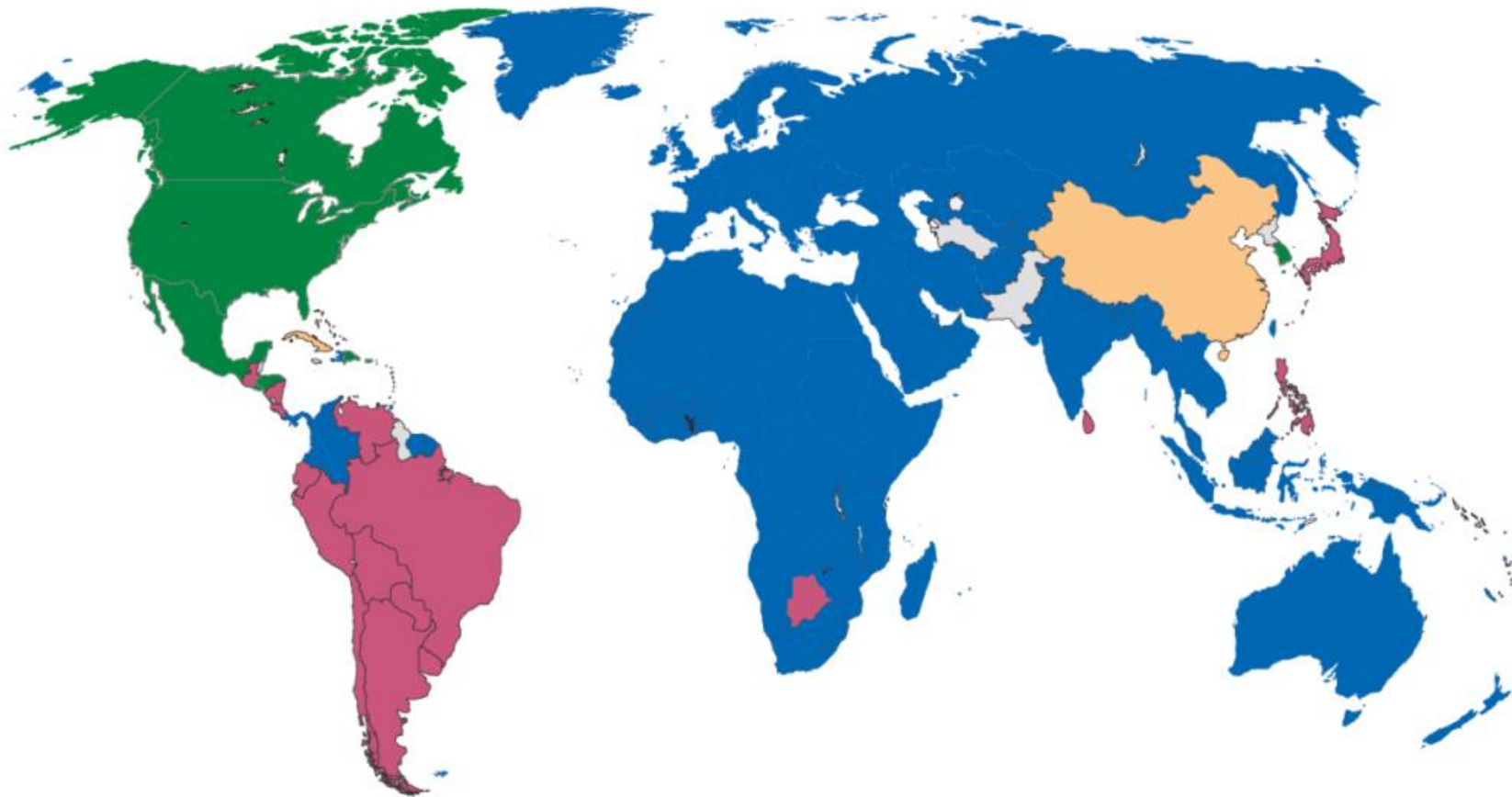
DTMB



What We Have Achieved



DVB-T/T2 Worldwide Success



ATSC 

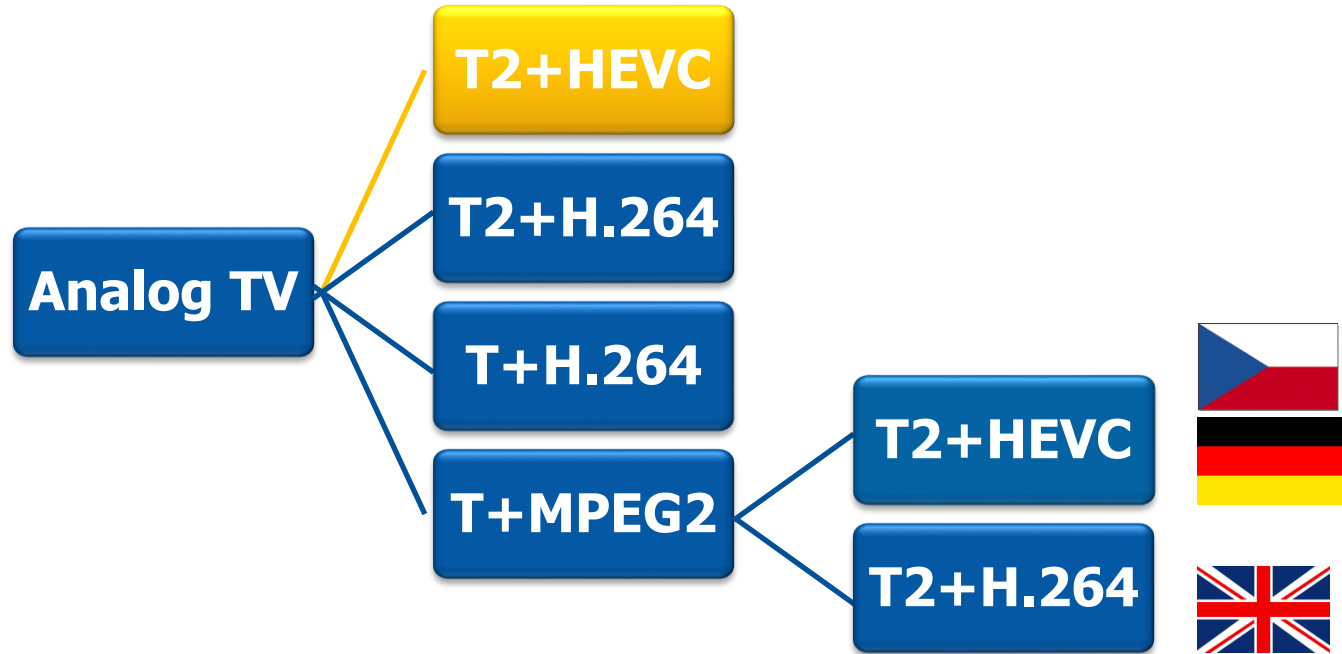
ISDB-T 

DTMB 

DVB-T[®] DVB-T2[®] 

DVB[®]

DTT Transition Scenarios



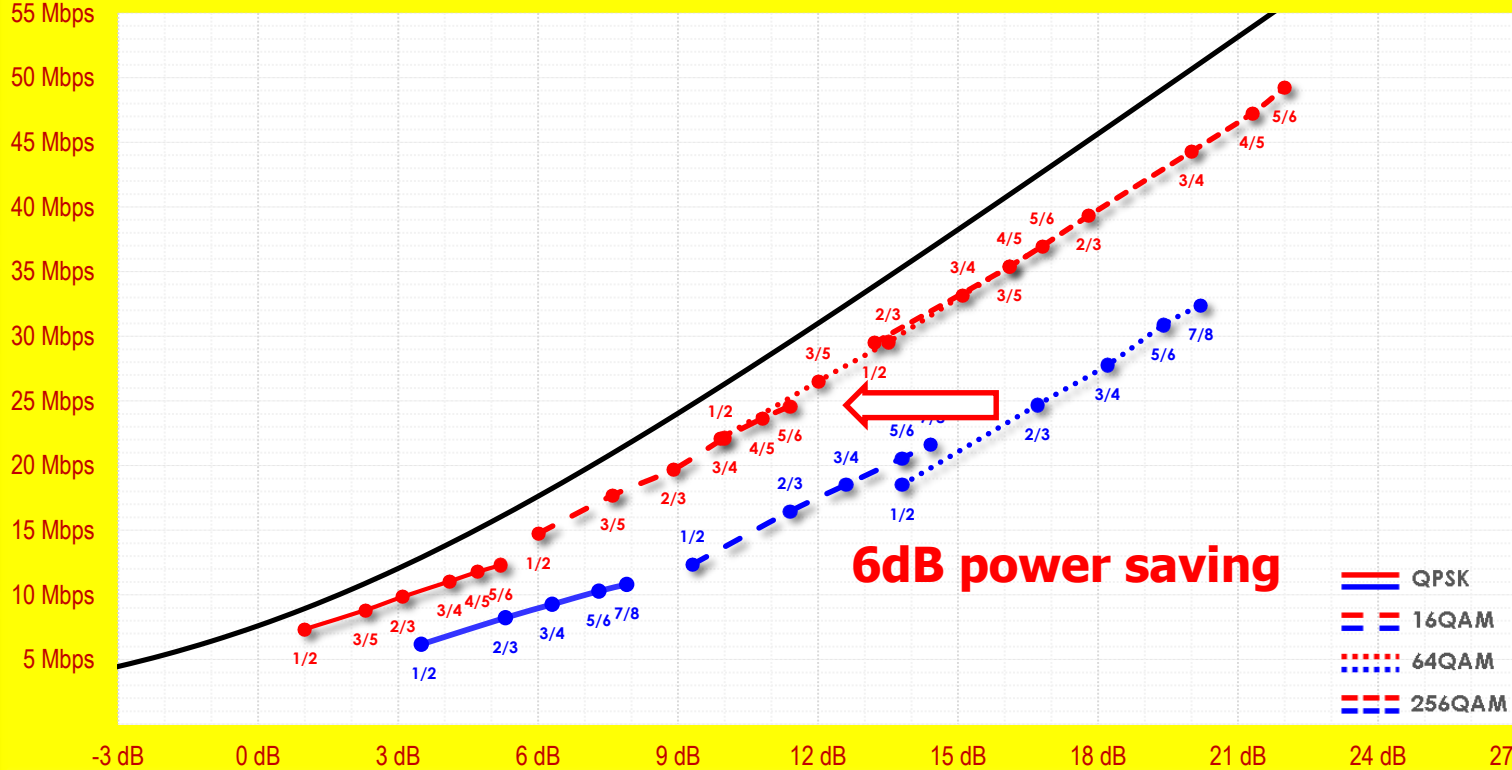
— Transition has already happened or is confirmed

— Potential transition in the future

Performance comparison DVB-T2 vs. DVB-T



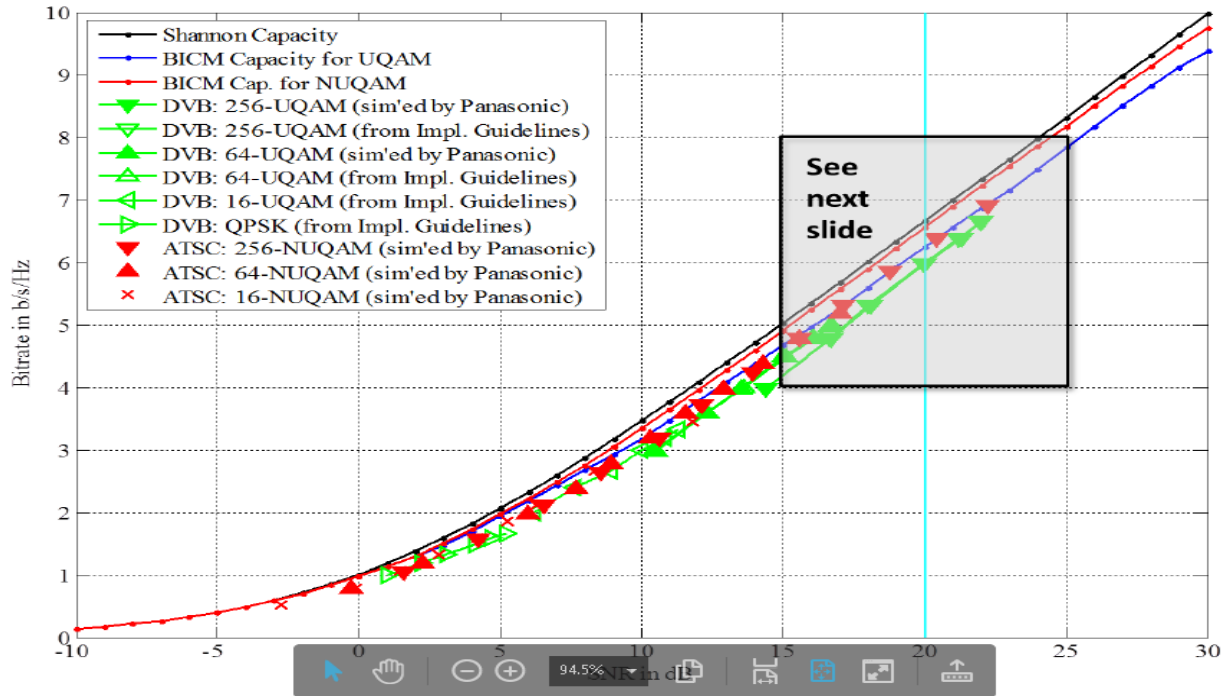
AWGN - Additional White Gaussian Noise
 Net Capacity in Stationary channel
 (C/N @ QEF : BER=10⁻¹¹ - DVB-T2 : Red / DVB-T : Blue)



DVB-T Implementation Guidelines (ETSI TR 101 190 (2008-10))
 DVB-T2 Implementation Guidelines (ETSI TS 102 831 (2011-12))
 © TeamCast 2012



Performance comparison ATSC 3.0 / DVB-T2



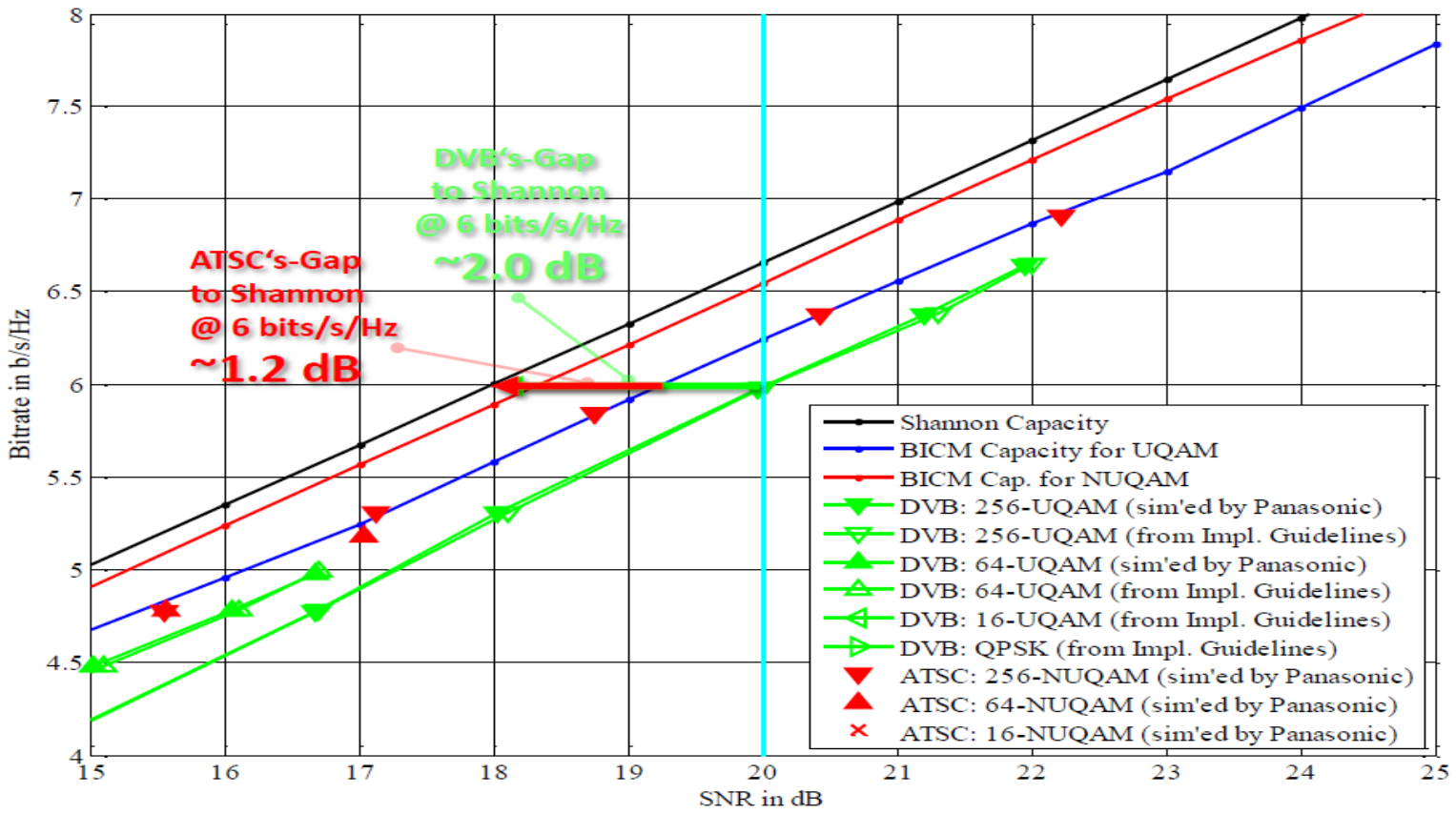
Slide 5

Slide 7

Source: Frank Herrmann, Panasonic



Performance comparison ATSC 3.0 / DVB-T2



Slide 6

Source: Frank Herrmann, Panasonic



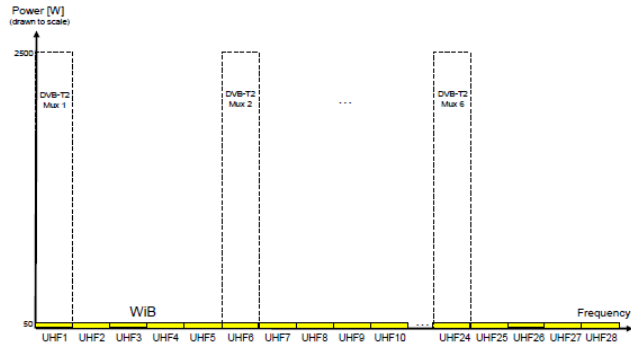
Slide 8

Spectral Performance of ATSC 3.0 and DVB-T2

- As compared to DVB-T2 the spectral performance improvement for a single channel is not even 1 dB
- For low SNR, which is the relevant region for mobile, there is basically no difference at all
- **Conclusion:** For the time being there are no technologies available to significantly improve the spectral performance of a **single** channel

Basic principles of WiB (1)

- Wideband
 - Wideband transmission as a single WiB signal
 - Covering potentially the whole 224 MHz UHF band (28 UHF channels)
- Reuse-1
 - Adjacent TXs use the same frequencies
 - Very challenging interference situation
 - e.g. $C/I = 0$ dB
- Robust transmission mode required
 - e.g. QPSK, req. C/N close to 0 dB
- Interference Cancellation
 - Removes unwanted interference



- Reduced Capex and Opex
- Increased capacity
- Evaluation in DVB Study Mission Group

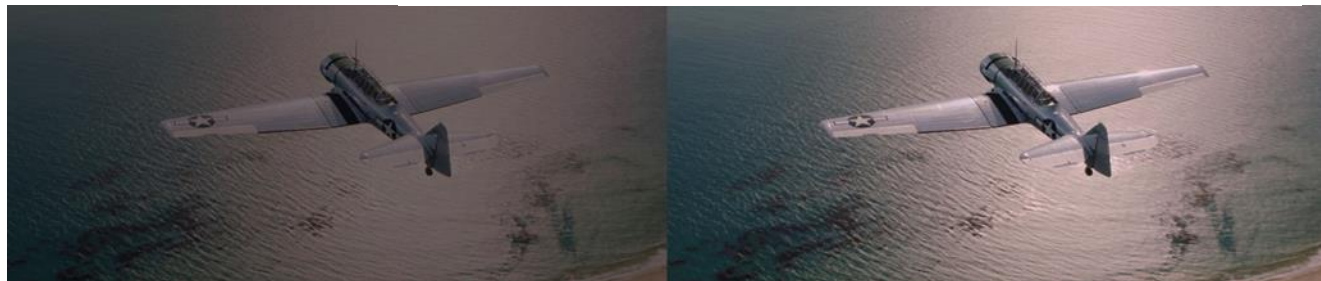
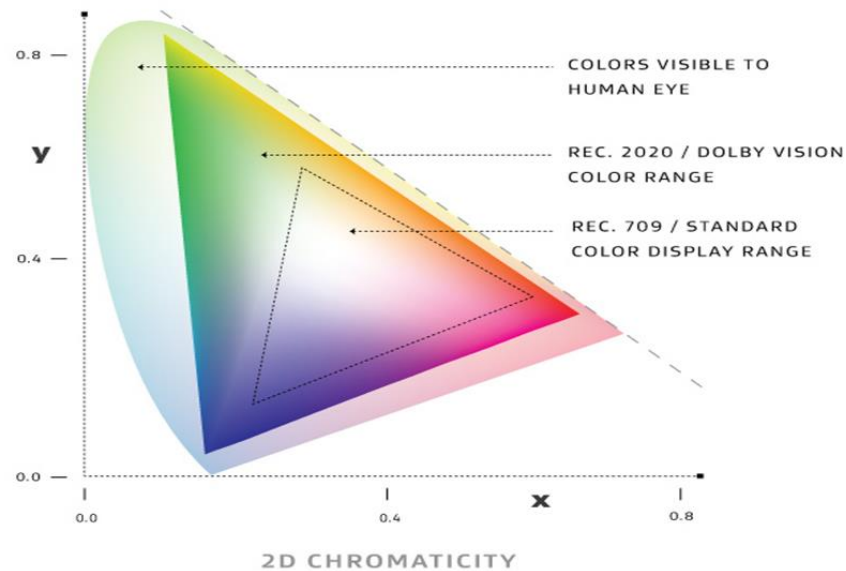
2016-01-03

Erik Stare

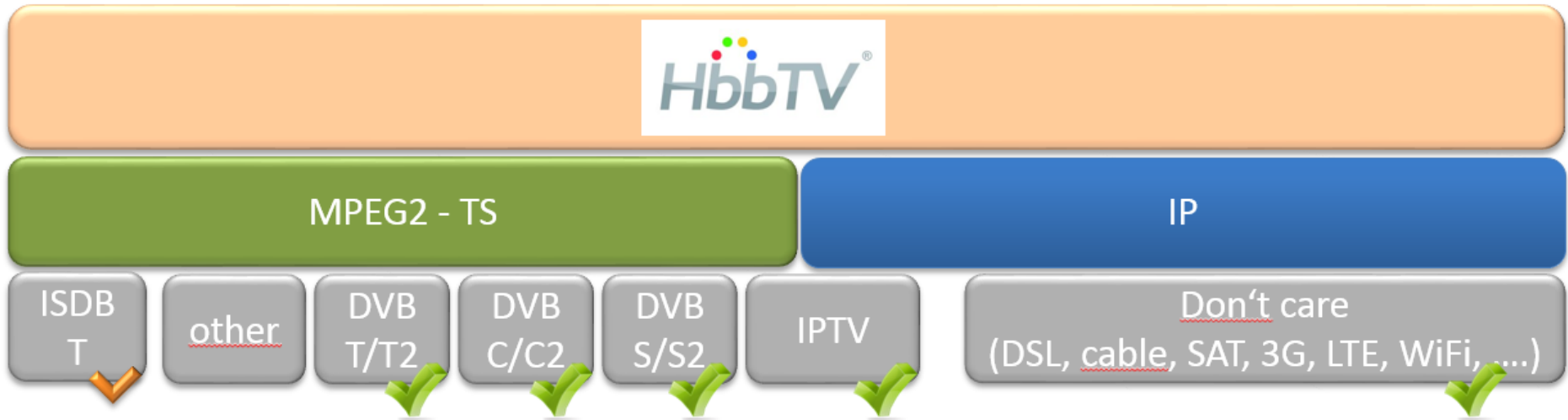
Source: Eric Stare (Teracom)


New UHD Phase 2 Features Also for DTT

- High Dynamic Range
 - HLG and HDR10
- Wider color
- Higher Frame Rates
- Next Generation Audio
 - MPEG-H
 - Dolby AC-4



Interactivity: HbbTV in all Networks



 In operation

 Technically proven

Large Variety of HbbTV TV-Apps



EPG



Children / Youth



Catchup / VoD



Timeshift / replay



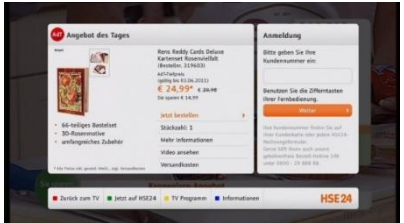
Games



Voting



Targeted advertisement



Shopping / „sales through“



Second screen



Social networks

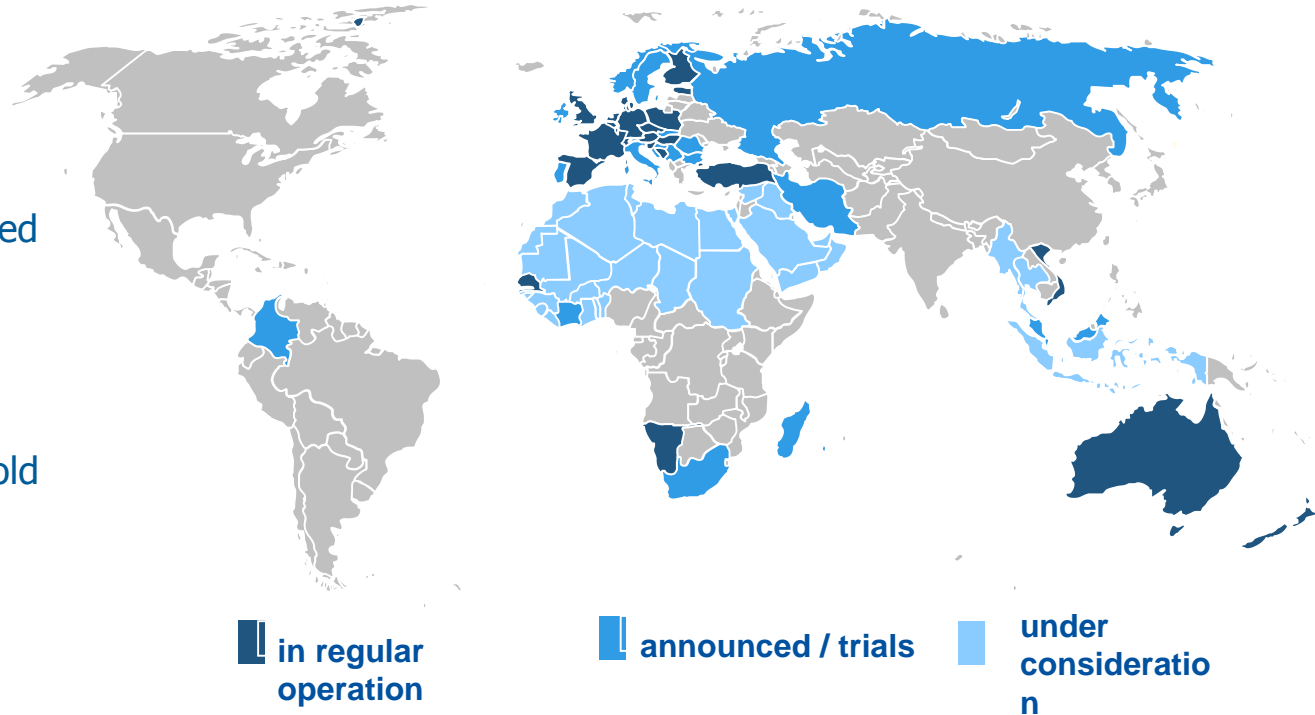


Live TV streams



HbbTV deployment worldwide

- Regular operation in 25 countries, more are preparing launch
- > 200 applications deployed
- > 40 Mio devices
- Used by millions of TV viewers every day
- > 80% of all Smart TVs sold have HbbTV
- Market penetration continuously growing

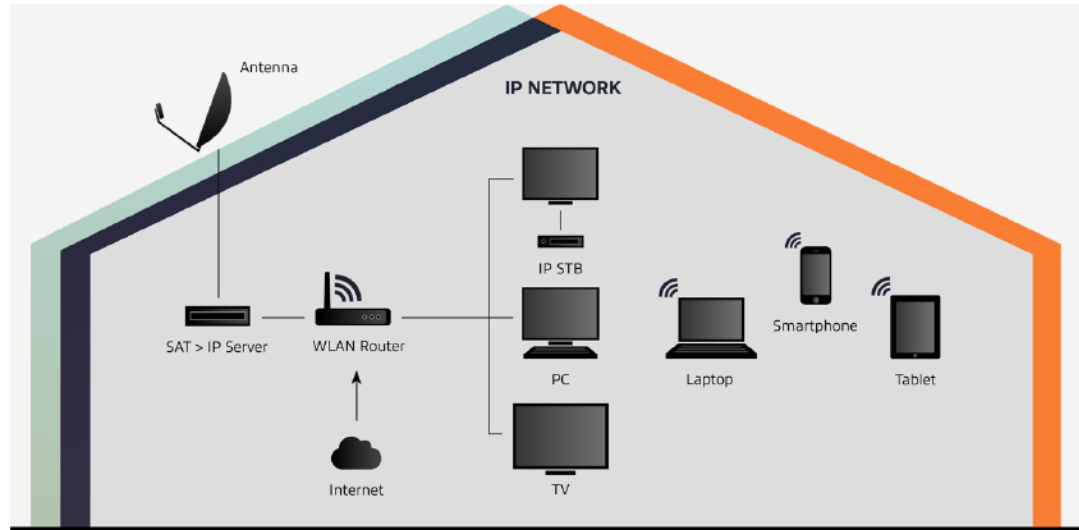


Status: July 2016

Solution for Wifi Distribution of Broadcast Content in the Home

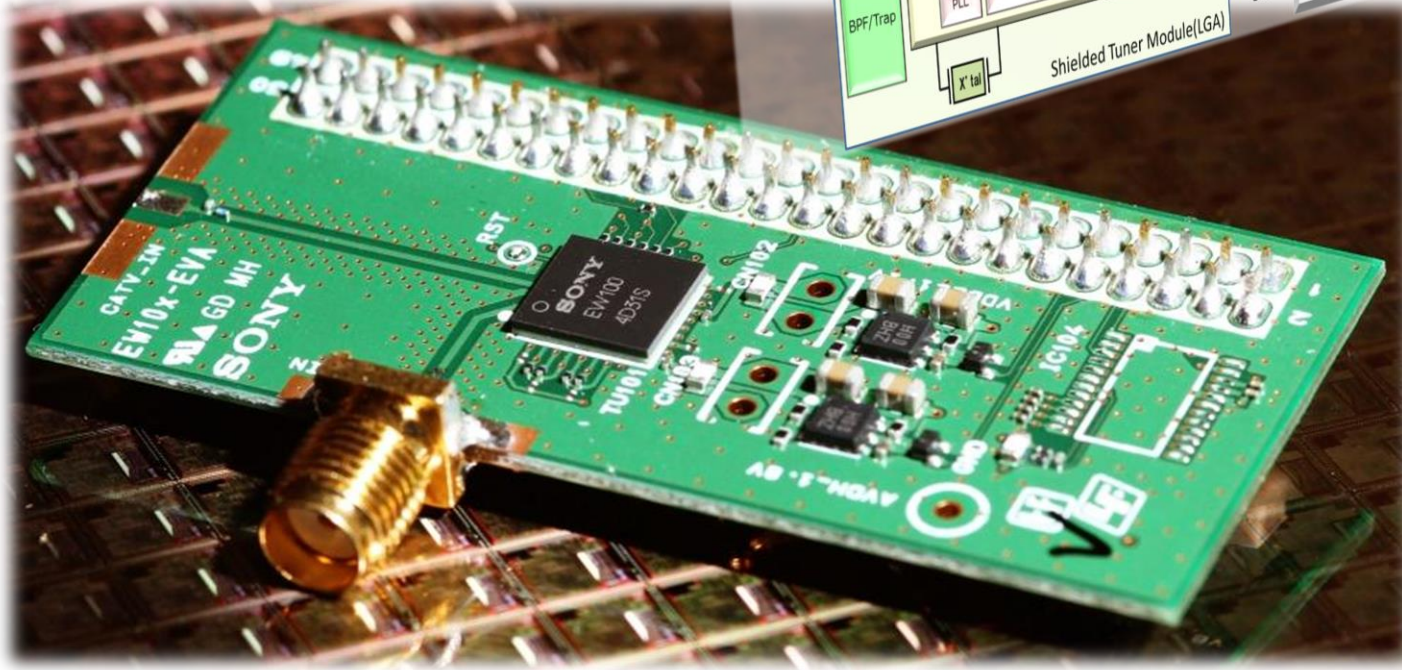
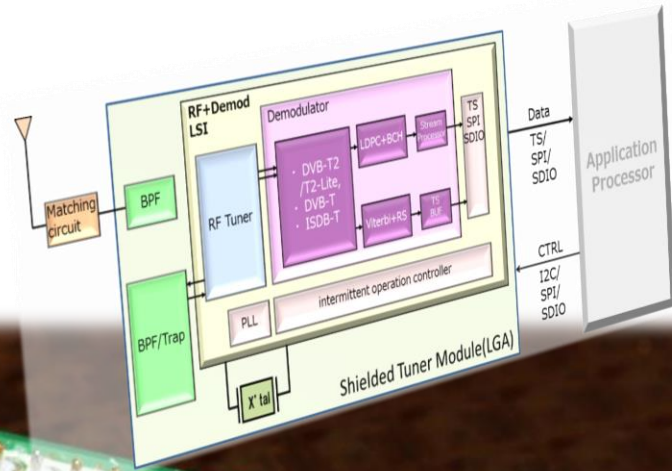
- SatIP supports wifi distribution for C/S/T and IPTV
- SatIP/DVB liaison agreement

SAT > IP

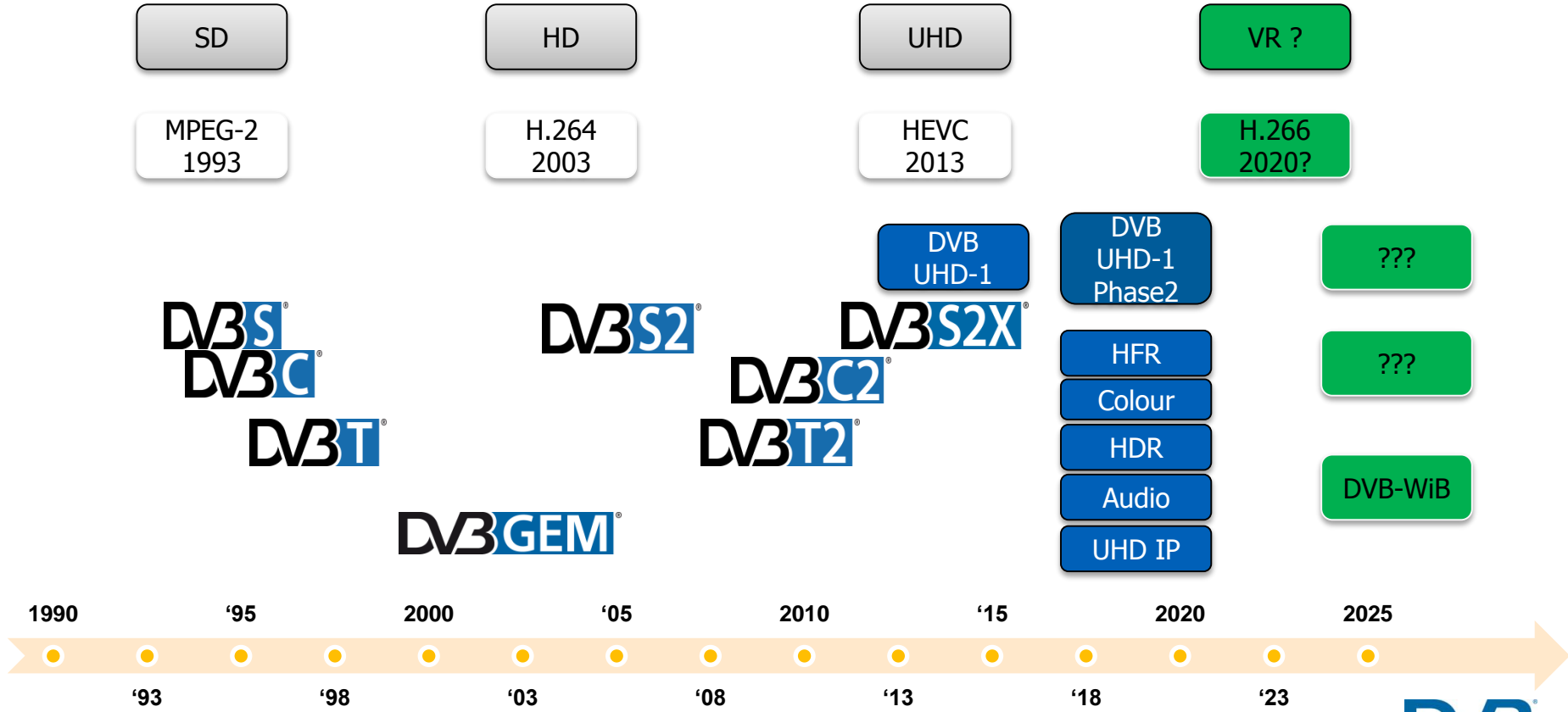


DVB-T2[®]

DVB-T[®]



The Future will Continue



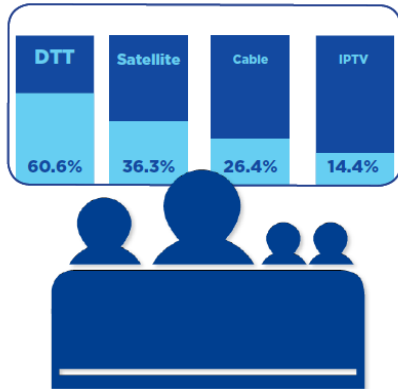
Conclusion

- For DTT we cannot expect spectrum efficiency improvements for single channel transmission. However overall network optimisation is possible
- The current UHD Phase 2 specification defines a new level of user experience
- IP and hybrid delivery and applications will be DVB's strategic focus
- For interactivity and hybrid applications HbbTV is our partner
- Broadcast is and will be an important factor
- DVB is committed to provide the necessary specification for the success of broadcast

DVB-T2: A European Success Story

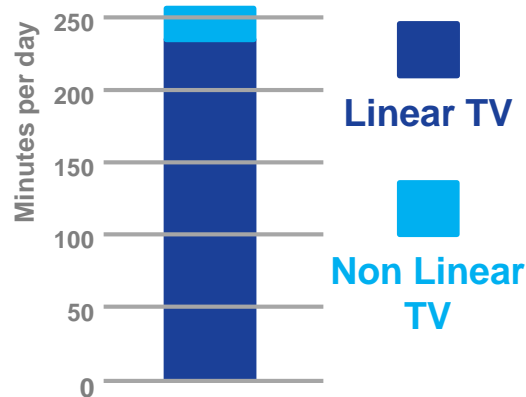
Dominant platform

118 million
households rely on
DTT



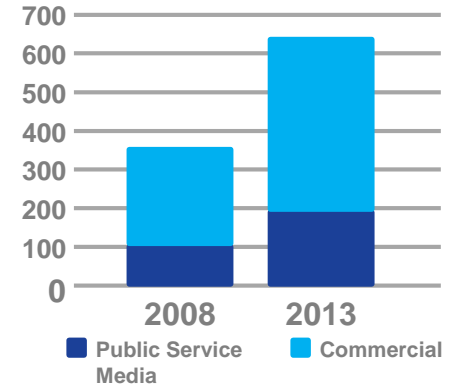
Linear TV is alive

3 hours of
watching
per day

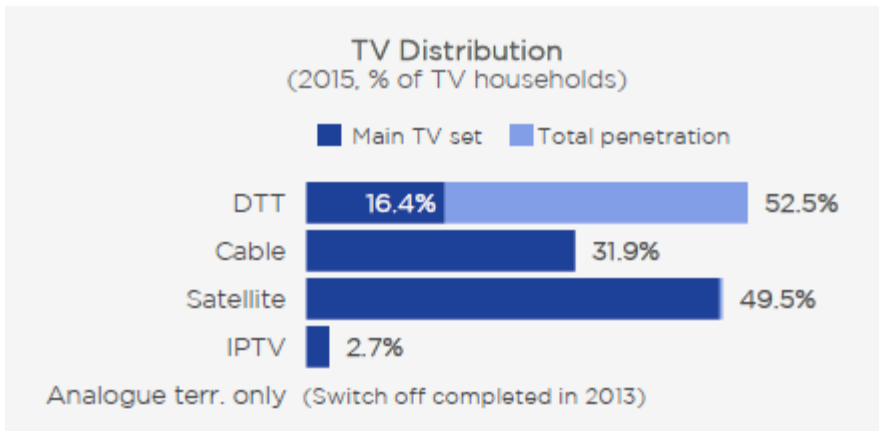
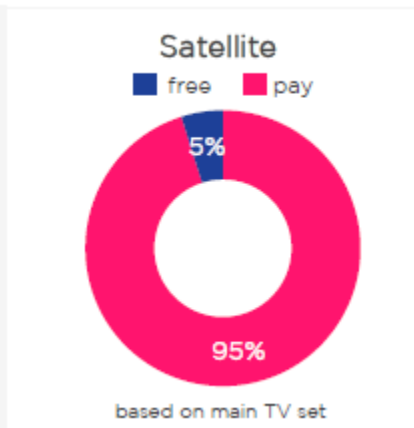
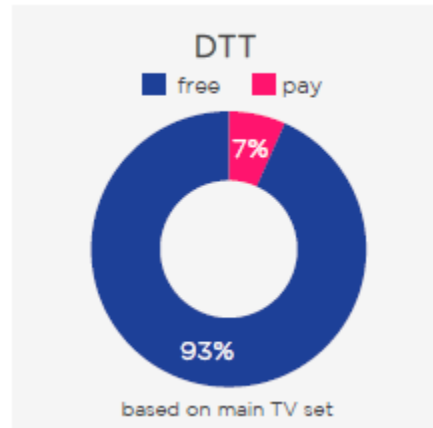
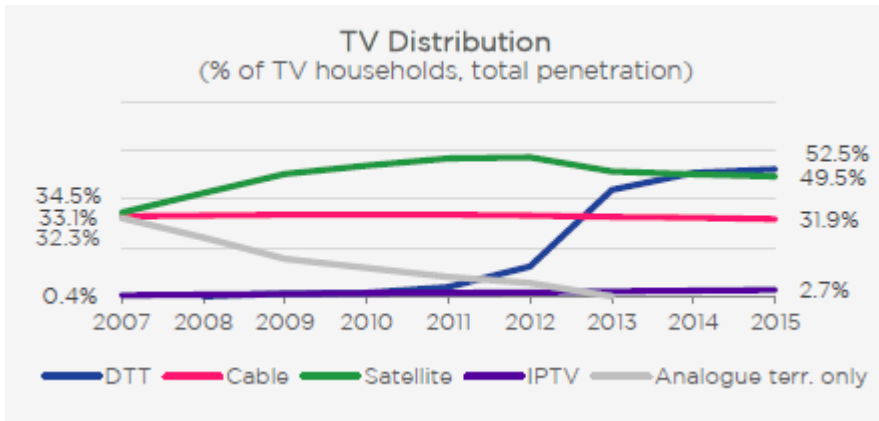


DTT is growing

80% growth in 5 years



DTV in Poland



GDP per capita is similar to Malaysia
(10840 Eur vs 8488 Eur in Turkey)

66% of TV revenues are subscription

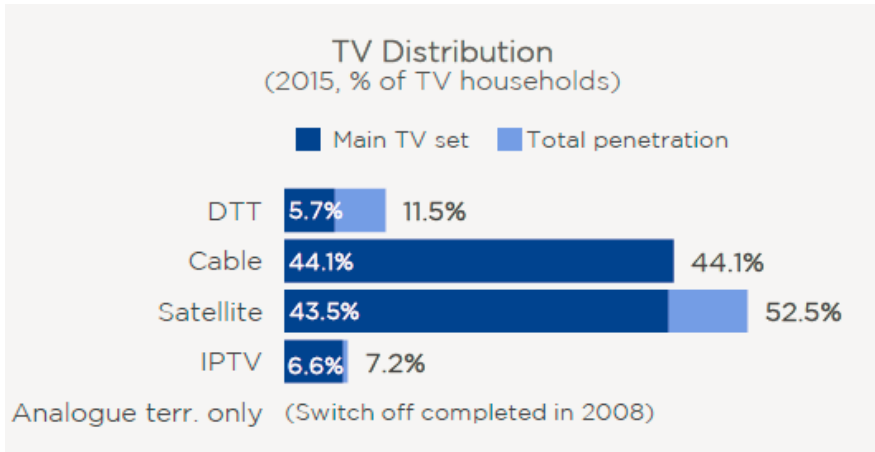
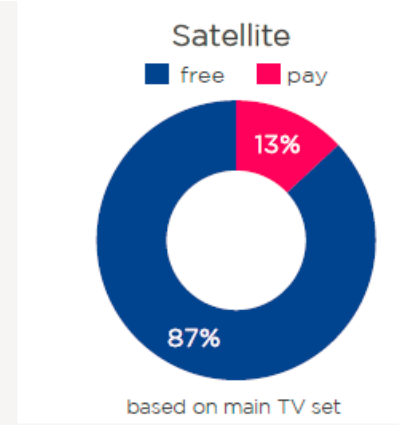
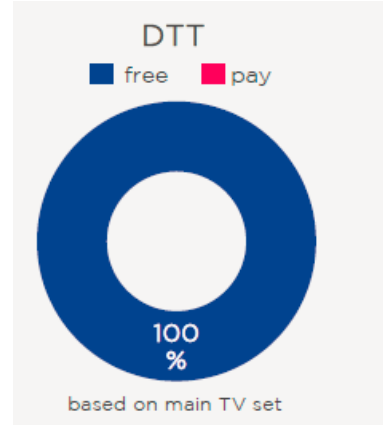
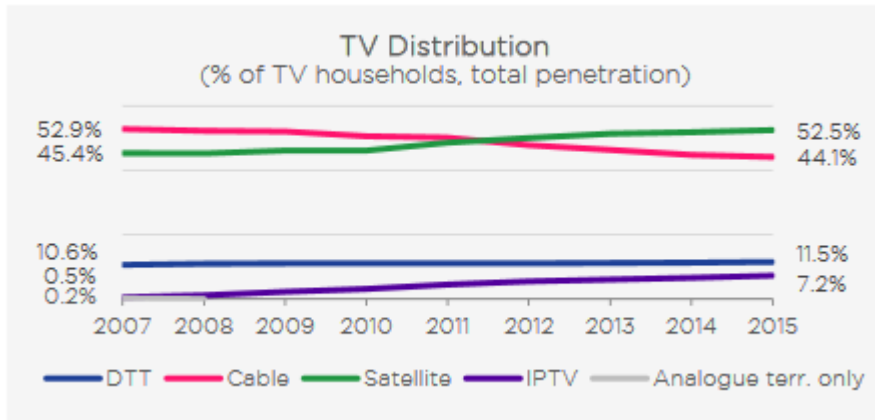
Strong uptake of DTT

Mobile services offered on DVB-T

28 FTA + 11 pay + 2 regional



DTV in Germany



Germany has started T2 with HEVC

1080p50 will deliver best quality

Portable reception

40 Free to air as well as pay TV services

Basic STBs below 40 Euros