Digital Switchover and Digital Dividend:
Europe and CIS countries

ITU Radiocommunication Bureau

Summary

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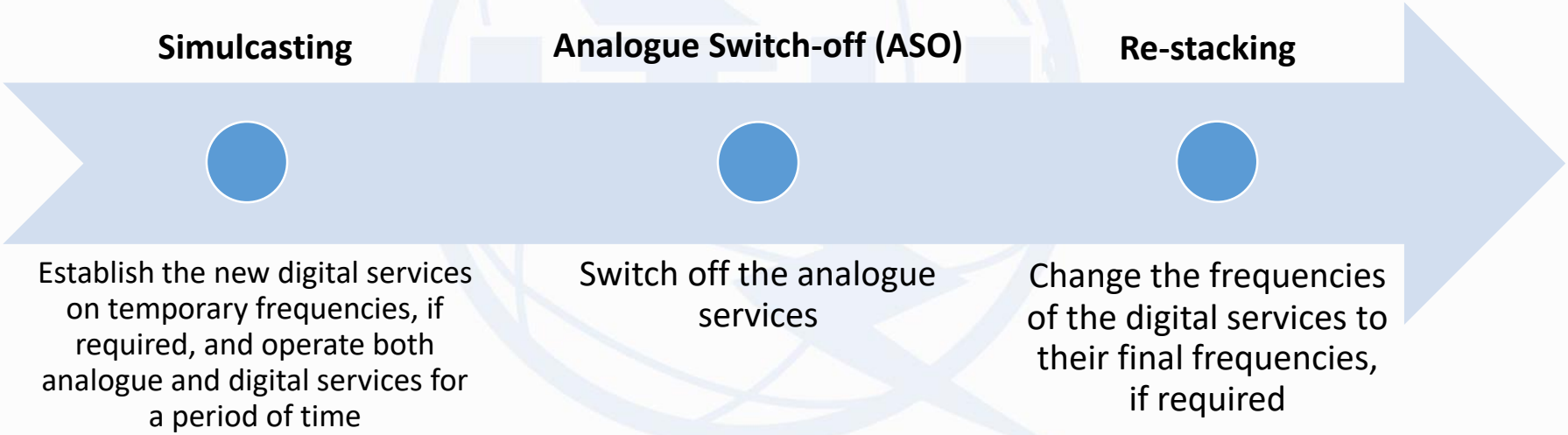
Definitions
Digital Switch Over (DSO)

DSO is the process in which analogue television broadcasting is replaced by digital television broadcasting.



Definitions
Digital Dividend (DD)

DD is the amount of spectrum made available by the transition of terrestrial television broadcasting from analogue to digital.

Some digital characteristics at the origin of DD:

- **Digital video compression** reduces the transmission size (bits) of the video signal.
- **Digital modulation (COFDM)** minimizes the multipath interference effect and the needed transmitting power is reduced.
- **Single-Frequency Networks (SFN)**: The same frequency can be used in adjacent cells as long as the same broadcast content is transmitted.

DSO Benefits

- Instead of one, typically from **4 to 8 digital programs** of equivalent or better quality can be broadcast in the same 6, 7 or 8 MHz wide channel
- **Improved picture and sound** quality and potential for **interactivity**
- **Economies** for broadcasters (less power, less transmitters, new pay-tv services…)

DSO Costs in Europe

Country	Purpose	Amount	Source
France	ASO + Help Scheme	€ 397 million	Government/Broadcasters
UK	Help Scheme	€ 693 million	BBC
	Marketing activities	€ 230 million	Digital UK
	DSO total	€ 4.37 billion	Private/public
Italy	Help Scheme	€ 50 per qualifying HH	Government
	ASO pilots	€ 55 million	Government
	DTT roll-out	€ 33 million (2007)	Government
	DTT subsidy	€ 220 million (illegal?)	Government
Spain	DSO projects	€ 75 million	Government
	DSO as of March 09	€ 1.2 billion	Private/public
Finland	ASO	< € 1 million	Increased license fee for YLE
Sweden	Help Scheme	No special budget	Government
	Marketing activities	€ 2 million	Government
USA	DTV coupon program	$ 1.9 billion	Government

Source: DIGITAG

DD Benefits

- A significant amount of high quality **radio spectrum** can be made **available for new services** (such as IMT) or to increase TV offer and new TV services.

- Economical (for regulators): Auction/Bids processes to award freed-up bands to new services

- Economical (for businesses): New business opportunities

Example of Auctions in 800 MHz band in Europe

Country	Amount of auction in €	Year of auction
Austria	**2 billion**	**Oct-2013**
Belgium	**360 Million**	**Nov-13**
Croatia	**40 million**	**Sep-12**
Czech Republic	**266 million**	**Nov-13**
Denmark	**99Million**	**2012**
Finland	**108 Million**	**30.10.2013**
France	**2.6 billion**	**Dec-11**
Germany	**3.57 billion**	**2010**
Ireland*	**854.64 million (spectrum fees included until 2030)**	**2012**
Italy	**2.96 billion**	**Jan-13**
Lithuania	**2,4 million**	**Oct-2013**
Latvia	**4.7 million**	**Oct-2013**
Netherlands	**3.8 billion**	**Dec-2012**
Portugal	**270 million**	**2012**
Romania*	**682 million**	**Sep-12**
Spain	**1,3 billion**	**Jul-05**
Sweden	**233 million**	**2009**
Switzerland*	**CHF 996.3 million**	**Jul-05**
UK	**2.7 billion**	**Feb-2013**

***: 800 MHz with other frequency bands**

Examples of 700 MHz band release and auctions

- **November of 2015:**
  700 MHz spectrum auction raised €2.8 billion
- **4th of April 2016**
  - MPEG-2 -> MPEG-4, maintaining the DVB-T: higher compression freed up spectrum for IMT
  - 25 DTT channels in HDTV
  - Better image quality

France

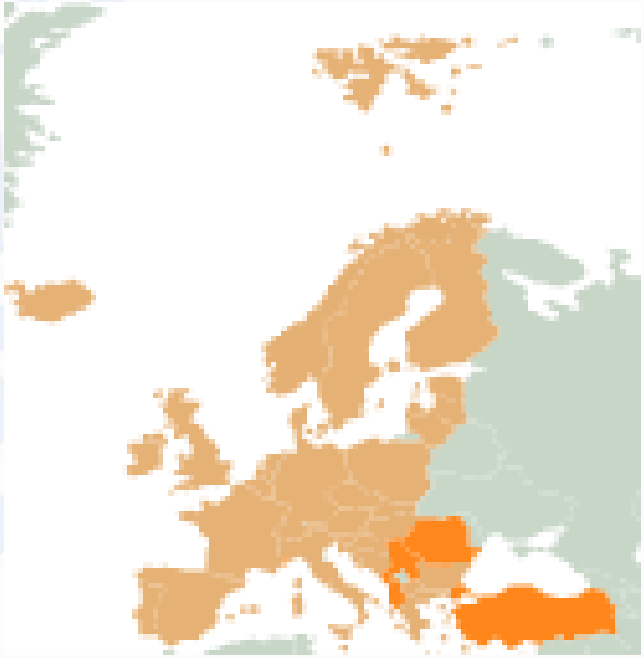
- **May 2015**:
  700 MHz spectrum auction raised €1.0 billion
- **29th of March 2017**
  - DVB-T/MPEG-2 -> DVB-T2/HEVC in several urban areas, Portable reception modes
  - Full DVB-T2 will be gradually rolled out until mid-2019
  - Around 40 public and commercial channels mainly in HD
  - Change in business model (monthly fee)

Germany

DSO Status in Europe

Europe has generally completed DSO

- **Completed**: 38 countries
- **Ongoing**: Albania, Bosnia and Herzegovina, Romania
- **Not started**: Turkey
- **Digital standard being used**: DVB-T / DVB-T2



Source: http://www.itu.int/en/ITU-D/Spectrum-Broadcasting/Pages/DSO/Default.aspx

DSO Status in CIS countries

Europe has generally completed DSO

- **Ongoing**: Armenia, Azerbaijan, Belarus, Moldova, Russian Federation, Ukraine, Uzbekistan
- **Not started**: Kyrgyzstan
- **No info:** Kazakhstan, Turkmenistan
- **Digital standard being used**: DVB-T / DVB-T2

Source: http://www.itu.int/en/ITU-D/Spectrum-Broadcasting/Pages/DSO/Default.aspx

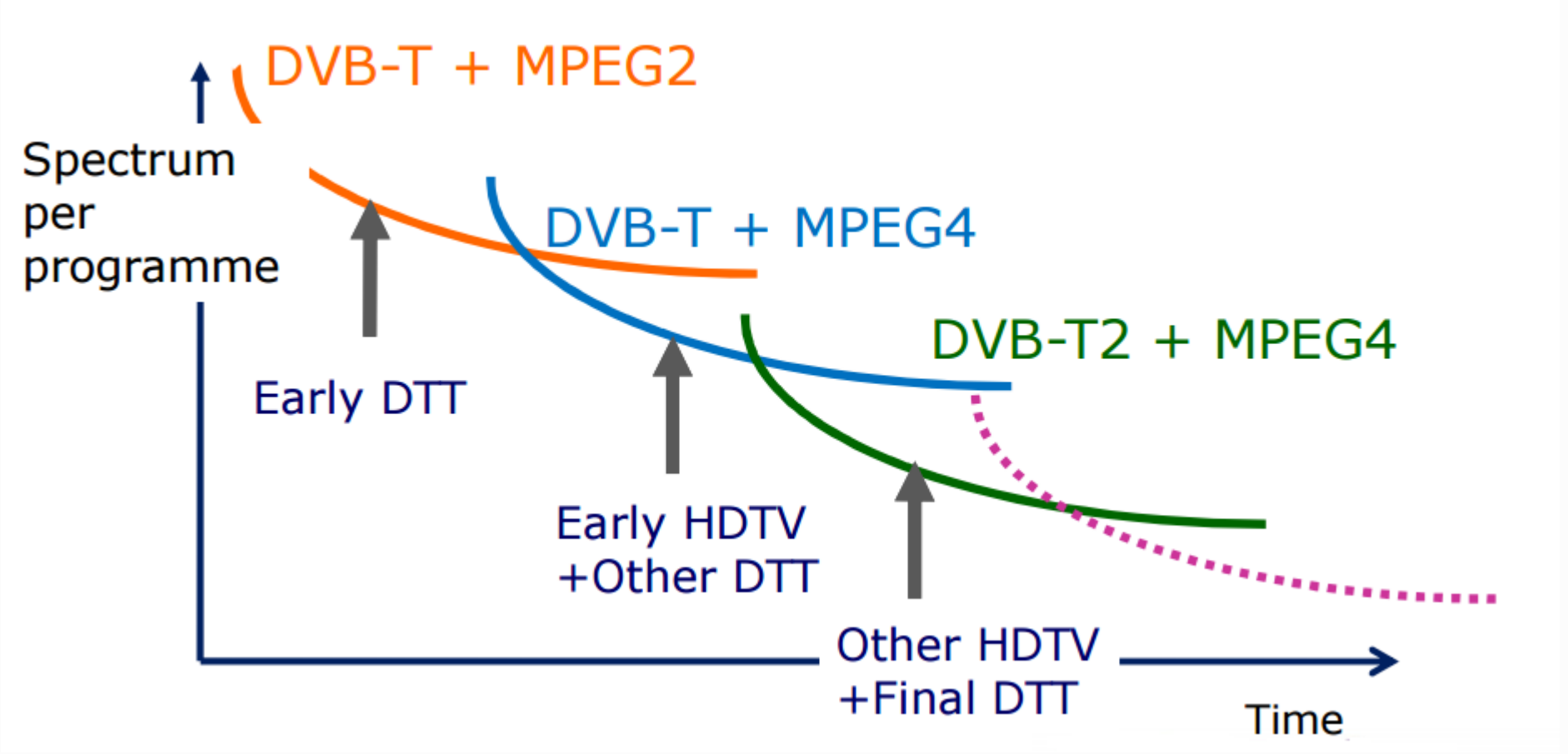
700 and 800 MHz Bands in CIS countries

- **700 MHz**: 694 – 790 MHz | **800 MHz**: 790 – 862 MHz
- **Mobile service** is allocated on a **shared co-primary basis** with the broadcasting service and aeronautical radionavigation service in countries listed in footnote 5.312 RR
- **Some countries has decided to implement IMT in those bands**

700 and 800 MHz Bands in Europe

- **700 MHz**: 694 – 790 MHz | **800 MHz**: 790 – 862 MHz
- **Mobile service** is allocated on a **shared co-primary basis** with the broadcasting service
- **800MHz band** has been assigned to **mobile services (IMT)**
- **700 MHz band**: European Commission obligation to repurpose to **mobile broadband by 2020.**
- **Technology transition** to DVB-T2/MPEG4 or HEVC will be instrument by which this will be made possible

Technology transition



Source: DIGITAG

Multilateral coordination

- in Europe coordination is being held through several groups: NEDDIP, WEDDIP, SEDDIF:
  - To build informal consensus on UHF band utilization, aimed at concluding formal agreements
  - To search additional TV channels below 694 MHz and to facilitate their coordination
  - To facilitate modification of the GE06 Plan through the Article 4 procedure by submitting coordinated requirements

- BSDDIF (Black Sea region): In progress

- With BR assistance:

  BSCSCA (Black Sea, Caspian sea and Central Asia region): In progress

  ASMG (Arab Spectrum Management Group): Achieved

  ATU (African Telecommunication Union): Achieved

  CAC (Region 2) (Central America and Caribbean): In progress

Steps to release the 700/800 MHz DDs and ensure the continuity of the DTT

- Evaluate the content that needs to be taken into account (present and future)
- Current demands have to be met: no loss of capacity or content. Demands can be met with introduction of DVB-T2 and HEVC

DTT Service Requirement :

- Re-planning the spectrum
- Introducing New Technologies
- Existing licenses and contracts
- Re-engineering of transmission sites

National Decisions

- Step 1: Common understanding about national requirements and access to spectrum
- Step 2: Allotment shapes and sizes are amended if necessary
- Step 3: whenever possible, exchange of DTT channels

International coordination

Challenges


Everybody is in favor of
spectrum harmonization
Everybody wants it
to be their own way

DSO Useful Links

- **Guidelines:** https://www.itu.int/en/ITU-D/Regional-Presence/AsiaPacific/Documents/AtoDguidelinesV3.pdf
- **Report:** http://www.itu.int/dms_pub/itu-r/opb/rep/R-REP-SM.2353-2015-PDF-E.pdf
- **ITU-R FAQ on the DIGITAL DIVIDEND and the DIGITAL SWITCHOVER:** http://www.itu.int/en/ITU-R/Documents/ITU-R-FAQ-DD-DSO.pdf
- **Website:** http://www.itu.int/en/ITU-D/Spectrum-Broadcasting/Pages/DSO/Default.aspx
- **Training:** https://academy.itu.int

Thank you!

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