Digital Switchover and Digital Dividend: Europe and CIS countries
Summary

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2. DSO/DD Benefits and Costs
3. DSO Status in Europe and CIS
4. 700 MHz and 800 MHz bands
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**Definitions**

**Digital Switch Over (DSO)**

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

- **Simulcasting**: Establish the new digital services on temporary frequencies, if required, and operate both analogue and digital services for a period of time.
- **Analogue Switch-off (ASO)**: Switch off the analogue services.
- **Re-stacking**: Change the frequencies of the digital services to their final frequencies, if required.
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

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

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

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

*: 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

- **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)

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**France**

**Germany**
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

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

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 have 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

**DTT Service Requirement:**
- 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

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


- **Training:** [https://academy.itu.int](https://academy.itu.int)
Thank you!
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