Digital Dividend and Harmonization

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Agenda

- Digital Dividend
- Need for harmonization

Digital Television and the dividends

- The digitalisation of the Terrestrial TV brings and offers better quality and new services such as HD to the viewers.
- The characteristics of digital TV standards allow the possibility to multiplex more than one source and broadcasting more than one programme in the same RF channel.

Digital Flexibility

- The transmission characteristics of digital systems involve a number of parameters which can be adjusted to trade-off service area, quality reception, transmission power, data capacity and spectrum requirement.
  - Type of digital modulation (e.g. QPSK, 16 QAM, 256QAM)
  - Error correction coding (e.g. rate ½, ¾)
  - Motion picture compression algorithm (e.g. MPEG2, MPEG4).

Spectrum Requirement

- The overall system (e.g. the families of ATSC, ISDB, DMBT or DVB), reception mode (e.g. fixed, portable, portable indoor, mobile) and the selected parameters chosen will determine the overall spectrum required to satisfy the program requirements.

Digital Efficiency

- A single analog program can be broadcast on one transmission channel of 6 MHz to 8 MHz bandwidth.
- The same transmission channel could carry from 2 to 20 digital equivalent programs simultaneously.
- Most Digital TV standards allow the implementation of single frequency networks, more spectrum efficient compared to the analogue networks.

Define Digital Dividend

- The digital dividend is the amount of spectrum made available by the transition of analogue television to digital.

Size of Digital Dividend

- Given the very important gains in spectrum efficiency resulting from the transition to digital, the digital dividend may represent very significant amounts of spectrum.

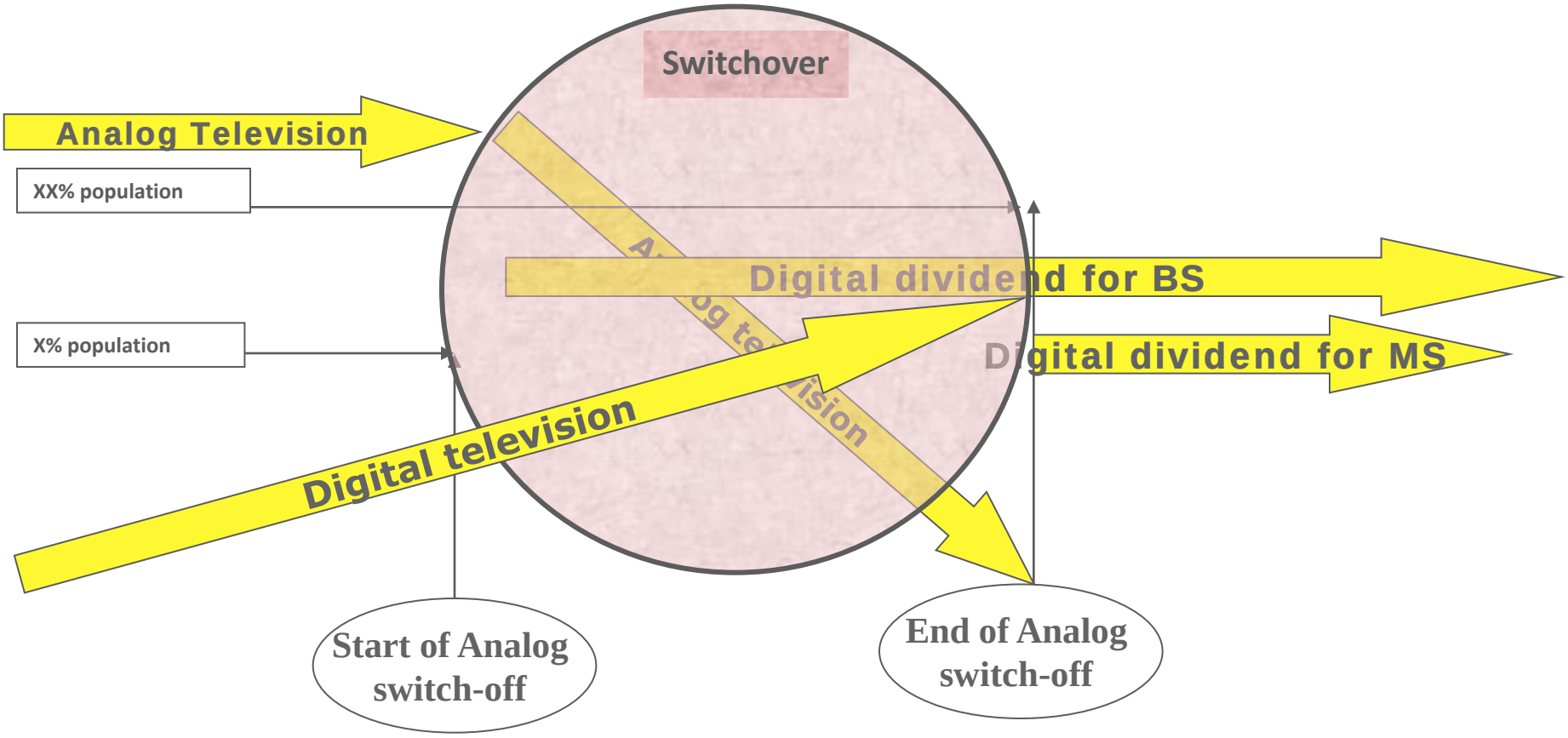
Allocation of Digital Dividend

- Broadcasting services (e.g. provision of more programs, high definition, 3D or mobile television).
- Other services, such as the mobile service, in a frequency band which could be shared with broadcasting (e.g. short range devices) or in a distinct, harmonized allocation (e.g. IMT).

Digital Migration and digital dividend

- Transition to digital TV is not an option
- Digital dividend is the output of Digital Switchover
- No digital dividend if not planned **together with** DSO.

Transition to digital TV and availability of digital dividend



Transitory frequency plan

Target frequency plan

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Need for Spectrum Planning

- Any intermediate plan is costly and disruptive. Even more when it is not planned in advance. Social impact: need to maintain reception + compensate cost impact.
- Need to interactively coordinate with neighbouring countries.
- Harmonized regional approach necessary. To maximize return avoid Interference.

Need for timely decision

- **Timely decision is crucial for the development and timely availability of the service. It requires:**
  - A Regional harmonisation framework
  - Frequency coordination negotiations
  - An allocation decision
  - Refarming of existing services
  - A Licensing process

- **Without the above, there won´t be any provision of any service anywhere.**

Need to coordinate

- Coordinated use of the 800 MHz band would facilitate roaming.
- The best possible approach is to provide harmonised conditions and to avoid fragmentation.
- Harmonising conditions and applying these in due time for achieving a “critical mass”, to ensure economies of scale.

Need for harmonization

- What made GSM such a worldwide success?

Answers

- A common technical standard

- Harmonized frequency bands

GSM

- Engagement by governments with the long term direction of national mobile infrastructures and a willingness to do this at the European level

- This led to the statement from the 1986 European Council. This political support gave the mandate to the European Commission to issue the GSM Directive

GSM (2)

- While this might be seen as governments imposing a technology on the market, the actual mechanism was that governments offered new spectrum “with strings attached” to support a harmonized system across Europe.

Importance of harmonization

- Spectrum harmonization reduces the cost of mobile hardware
- Enables global roaming
- Reduces the complexity of the radio design
- Reduces interference with adjacent services and helps managing cross-border interference

Global international framework for the digital dividend

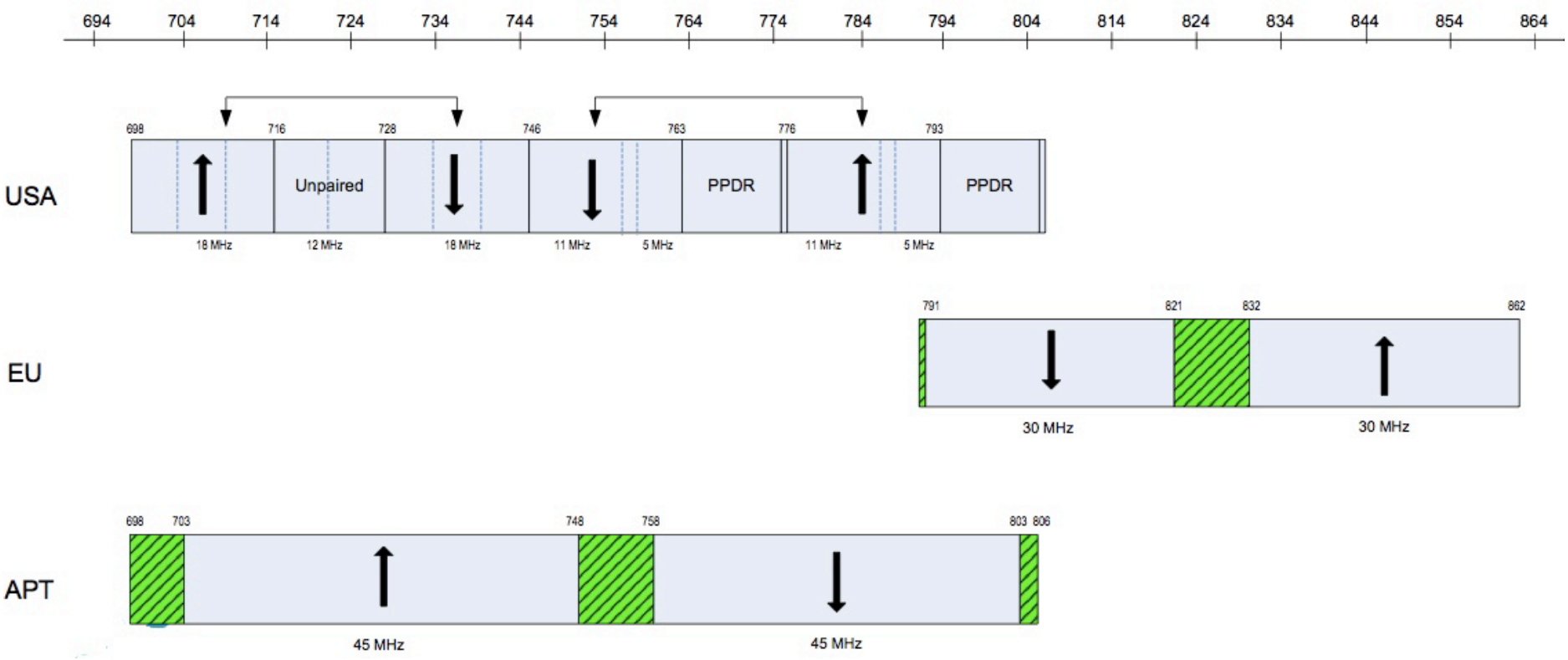
International Telecommunication Union (ITU):

- Timely adoption and/or update of the international regulations on the use of spectrum: Radio Regulations and Regional Agreements,
- Standardization of radiocommunication equipment
- Information and assistance to ITU membership

ITU decisions

- Frequency allocations
  - 790-862 MHz band allocated worldwide and identified for IMT
  - 698-790 MHz also allocated in Regions 2 and 3, and identified for IMT in Region 2 and some countries of Region 3
  - Res. 224 and 749 (Rev. WRC-12)
  - Res. 232 (WRC-12)
  - WRC-15 expected to increase these allocations/identifications (Agenda items 1.1 and 1.2).
- IMT-advanced specifications (RA-12)

Mobile broadband harmonisation at 700/800 MHz



Source: MED, New Zealand

Release of the digital dividend for mobile

- Release is not automatic. It requires:
  - Regional cooperation/coordination decisions
  - National Spectrum Allocation decisions
  - Frequency coordination and replanning with neighbouring countries
  - Refarming of existing services
  - Licensing

Digital Dividend - A national decision?

- To take the decision on Digital Dividend at the national level, it is important to take measures at the international level:

  - Agree on a common allocation to the mobile service as part of the digital dividend
  - Coordinate frequencies and technical characteristics of national television assignments in the band allocated to broadcasting, to enable transition to digital broadcasting and analog switch-off, hence release of digital dividend spectrum for both mobile and broadcasting. **This involves renegotiating the GE-06 Agreement**
  - Harmonize the timing of transition from analogue to digital
  - Resolve any remaining interference problems

What if re-planning of services is required?

Re-planning of broadcasting services

- Modifications of initial requirements of allotment and assignment formulated for the establishment of the Plan.
- Minimizing the interference potential on neighbouring co-channel GE06 Plan entries with lower power transmitters instead of planning one.

Re-planning of Broadcasting Services (2)

- Restricting transmitting power in certain directions for broadcasting networks implemented in conformity with the GE06 Plan entries or/and changes in transmitter characteristics (e.r.p., antenna diagram, tilt, etc.) of planned and implemented broadcasting networks interfering towards new requirements.

Re-planning of Broadcasting Services (3)

- Accepting that modifications of GE-06 plan entries involve additional investment costs.

Planning principles – Mobile services

- European administrations practice the recommendations given in the CEPT Report 29 “Guideline on cross border coordination issues between mobile services in one country and broadcasting services in another country”.

Planning principles – Mobile services (2)

- This report provides reference field strength trigger values for coordination. The values are derived from the GE06 Agreement.
- http://www.erodocdb.dk/Docs/doc98/official/pdf/CEPTREP029.PDF

Thank you for your attention!

Questions?

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