Service Demands for Terrestrial Broadcasting

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How important is terrestrial broadcasting?

- Requirements differ from country to country depending for instance on cable and satellite penetration
- Terrestrial is probably the platform where broadcasters are in the best position to control delivery of their channels
- Terrestrial broadcasting can reach "everybody" - if sufficient spectrum is available
- Terrestrial platform necessary to deliver portable and mobile services
- The terrestrial platform should be attractive in order to compete with other platforms
Do we know how much spectrum the broadcasters need from the Digital Dividend?

Two recent headlines from Europe

Despite official claims that there is no digital dividend the country’s largest communications association says there clearly is but it’s been grabbed by the powerful broadcasting industry.

There should be enough spectrum to accommodate the ambitions of both TV companies and telecoms operators when the digital switchover is complete, according to the country’s digital dividend commission.

Which one is true?
There is great interest in the value of the digital dividend and other users are making their bids.

“TV white space offers a once in-a-lifetime opportunity to provide ubiquitous wireless broadband access”

Following a successful campaign in the US 700MHz auction, Google is stepping up its lobbying for “greater wireless choice and innovation” both in the US and internationally.

GSM Association/GSM Europe objectives for 470-862 MHz
- Efficient solution for the band 790-862MHz
- Flexibility for the extension of mobile spectrum below 790MHz, for countries that wish to implement
- Enable countries needing to protect broadcasting in neighbouring countries to make efficient use of the available spectrum

Broadcasters need to make their case!
... concerning reaping the full benefits of the digital dividend in Europe. A common approach to the use of spectrum released by the digital switchover:

470 MHz <-----------------------------UHF band-----------------------------> 872 MHz

<table>
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<tr>
<th>Spectrum used for the continuation of existing TV and radio services</th>
<th>Vacant spectrum for national part of the digital dividend e.g. more SD or HDTV</th>
<th>Example service: narrow-band mobile TV</th>
<th>Example of services: wireless broadband access, high speed mobile data access</th>
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| Unidirectional Networks (high power) | Unidirectional networks (low to medium power) | Bi-directional networks (low power) |
HDTV & Mobile Television
Basic assumptions to derive service demands

- HD expected to be necessary by most channels by 2015-20
- 20 to 25 broadcasting programmes necessary
- DVB-T2 & MPEG-4 (H264) will be the standard for terrestrial TV
- Compatibilities guaranteed by DVB-T2
  - current transmitting sites
  - current receiving installation (single polarisation)
  - GE06 plan
    - Compatible spectrum mask
    - same or better protection ratios
    - better impulsive noise rejection (> 10 dB)
    - larger allowed SFN transmitter inter-distance
- One multiplex will be able to carry 3-4 HD programs
- Mobile TV will use DVB-H with a mixture of broadcasting and other services combined in a multiplex - assume 20-25 programmes
Mobile Radio & Multimedia
basic assumptions to derive service demands

DAB Transmission System
(1.75 MHz bandwidth multiplex)

DAB Audio
Radio
6-9 audio services per multiplex
(DAB stereo audio at 128 kbps)

T-DMB

Mobile TV
~ 9 “visual radio” services per multiplex

DAB+
Radio
18-24 audio services per multiplex
(DAB+ stereo audio at 64 -48kbps)

It is necessary to provide 50-70 audio programmes
plus 20 to 25 multimedia programmes
Capacity of UHF bands IV/V for broadcasting

Total available national DVB layers GE06

DVB-H layers

DVB-T layers currently awarded

DVB layers use currently undecided

Do broadcasters need the layers whose use is currently undecided?
Capacity of VHF band III for broadcasting

A (7 MHz) DVB-T channel can be converted into 4 (1.75 MHz) T-DAB blocks.

An alternative arrangement for Band III is 7 layers of DAB+ or T-DMB.
Spectrum Demands for Bands IV/V full access

UHF
470 – 862 MHz

Total of
7 to 8 DVB Muxes

2 DVB-H Muxes
≥ 24 Video programmes

5 to 6 DVB-T Muxes
20 to 25 HD programmes
Spectrum Demands for Bands IV/V with no access to 790-862 MHz

- **UHF** 470 – 790 MHz
  - Total of 5 to 6 DVB Muxes
    - 1 DVB-H Mux
      - ≥ 12 Video programmes
    - 4 to 5 DVB-T Muxes
      - 12 to 20 HD programmes
Spectrum Demands for Bands III Option for DVB and DAB

VHF
174 – 230 MHz

1 DVB-T Mux
2 to 3 HD programmes

3 DAB+ Muxes
50 to 70 stereo radio programmes
Spectrum Demands for Bands III
Option for DMB and DAB

VHF
174 – 230 MHz

4 T-DMB Muxes
12 to 24 Video programmes

3 DAB+ Muxes
50 to 70 stereo radio programmes
Summary results

- HDTV: 20 - 25 programmes
  6-8 (8 MHz) multiplexes for DVB-T/T2

- Mobile TV: 20-25 programmes
  1 to 2 (8 MHz) multiplexes for DVB-H

- Mobile Radio: 50 programmes
  3 (1.75 MHz) DAB+ multiplexes

- Mobile Radio plus Multimedia: 20 to 25 multimedia programmes, plus
  50-70 audio programmes
  7 (1.75 MHz) DAB+/DMB multiplexes
Conclusions on spectrum requirements

- In order to accommodate projected future broadcasting requirements full access to the VHF/UHF bands is needed.
- This assumes, based on some optimistic forecasts, that certain key technological advances are realised within the next five or so years.
- If significant proportions of the digital dividend are re-allocated to other services, it will severely inhibit the potential for broadcasters to provide the range of national services needed to attract a viable audience on the terrestrial platforms.

What to do?
Digital Dividend - possible strategies

- If assumption on requirements is correct all of the digital dividend is necessary for broadcasting
- EC (and others) want wireless communication in the upper part of the UHF frequency band
  1. Should broadcasters accept that we will lose some spectrum and work for the least radical solution?
     or
  2. Should broadcasters take the position that we have a strong case for use of the spectrum and use any possiblity at national and international level to argue for that position?
Possible strategy 1

- Accept that spectrum will be used for other services and work for the least radical solution
  - As small part of the UHF spectrum as possible for other services (CH 61-69?)
  - No mandation: national decision depending on requirements and national frequency management
  - Transition period necessary in order to replan (if possible) and to recap investments in networks
- Broadcasters could perhaps also benefit:
  we are all offering a wide selection of services on the internet and want these services to be widely available
Possible strategy 2

- The Digital Dividend should be used for broadcasting
  - Broadcasters fight for use of the spectrum
  - The spectrum is planned and readily available for that use (after switchover)
  - There are other frequency bands available (and not used today) for mobile communication and wireless internet services
  - Other (higher) frequency bands technically more suitable for wireless broadband
- Even the present Digital Dividend spectrum is barely sufficient for estimated broadcasting requirements
Using the Digital Dividend
what strategy for broadcasters???

- **Strategy 1?**
  - Work for least radical solution

- **Strategy 2?**
  - Fight for broadcasting use of the *Digital Dividend*

- **Are there other alternatives?**
  - Broadcasters discuss on a national basis with their administrations
Thank you for your attention

Any questions?