

Digital Terrestrial Television

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Digital Dividend

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- A non profit association formed in 1996, in the vicinity of the DVB project and the EBU, in Geneva
- To promote and help Digital Terrestrial Television launch and development in Europe
- Created by 70 member organisations from 4 constituencies
 - ❑ Broadcasters (public, commercial, private)
 - ❑ Manufacturers equipment and consumer products
 - ❑ Network and transmission operators
 - ❑ Broadcast regulators and frequency spectrum administrations

- The words « Digital Dividend » are used for designating two different topics:
 - ❑ The upper part of the UHF band(792MHz and above)
 - ❑ The spectrum made available when analogue terrestrial TV services have migrated to DTT services
- It has to be noted that in order to encourage consumers to migrate to DTT by themselves(so to minimize the need of subsidies for helping the process), the DTT offering has already been enlarged as compared to the original analogue TV offering (example 18 FTA+9pay DTT channels versus 5 analogue in France)
- So, one has to keep in mind that DTT is already using part of the Digital Dividend, and indeed utilises far more than 1/6 or 1/4th of analogue TV spectrum !

- MPEG-4 AVC compression technology in combination with the DVB-T technology, has already allowed the introduction of HDTV services on the DTT platform in France, Hungary, Italy, UK. It is expected that this trend will substantially increase in the coming years as several other countries(Finland, Sweden,) have already announced plans to launch such services, making use of DVB-T2 MPEG4, and that there will be further plans to provide "Full HD" in 1080p/50.
- While mobile television develops so far quite slowly, the mass consumption of such services will require the use of DVB-H broadcast technology, and, in the future, DVB-NGH, to avoid the saturation of 3G and LTE networks.
- It should also be noted that in many European countries, it has not been possible to provide a full range of regional and local television services during the simulcast period due to a lack of available frequencies. Frequency capacity will need to be reserved for such services at the completion of digital switchover.
- Other services such as catch up TV with Push VoD are under consideration or even already launched
- This will not be the end of the DTT story. Work is already in progress to prepare the development of 3D TV.

- The digital dividend, combined with spectrum optimisation and use of innovative technologies will make possible provision of the necessary spectrum resources for ensuring that the DTT platform will be able to cope with these future challenges, as well as to provide regional policy benefits:
 - ❑ In accordance with the GE06 rules and the coordination process between countries, spectrum optimization will allow to add new DTT networks on a national basis beyond the GE06 layers. This had led France to set the “Plan Numérique 2012” providing 11+2 layers, and similar plans are considered in other countries
 - ❑ The use of innovative technologies both for compression and transmission of TV signals (MPEG-4, DVB-T2) will be essential for providing further spectrum optimisation
 - ❑ Other use of the digital dividend by making available the upper part of the UHF band (above 790 MHz) for services other than TV, such as wireless broadband should remain limited to this extend (so that not to prevent the DTT platform to have the necessary spectrum resources for its future development)

1. In terms of quality, due to threaten of interferences from:

1. LTE
2. Cognitive Radio/ White Spaces
3. Power Line Telecommunications

2. In terms of quantity, due to threaten of a Digital Dividend 2

Item 1.1 is related to the process of granting frequencies by administrations

Items 1.2 is subject to a report of CEPT SE 43 and is subject to public consultation since September 30th, will be dealt with at the upcoming WRC 2012, but is not stricto sensu related to Digital Dividend(*)

Item 1.3 is subject to current work in ITU SG 1&6(but is not related to Digital Dividend(*)

Item 2 is subject to proposals for the upcoming WRC 2012, in order to have it on the agenda of WRC 2016, and starts to be appearing in the draft decision on the Radio Spectrum Policy Programme proposed by EC to Parliament and Council

(*) see back up slides

- GSMA has proposed to last CPG PT A that WRC 2012 should put Digital Dividend 2 (700MHz) on the agenda of WRC2016 conference
 - ❑ "To consider the frequency bands identified for IMT with a view to rationalising, consolidating, and expanding these as appropriate, with the objective of achieving internationally harmonised bands, preferably on a global basis."
- Finnish Administration that the whole UHF should be allocated to mobile wireless broadband as an equal primary service with broadcasting service:
 - ❑ "to consider the spectrum related issues for International Mobile Telecommunications (IMT), including a new primary mobile service allocation in the frequency band 470-790 MHz in Region 1, taking into account the current and planned use of this band by services to which this band is allocated"
- Finnish proposal was badly received, but GSMA proposal seems to get some support from several administrations, including Hungarian
 - ❑ Being a world wide organisation, GSMA will lobby other continent of Region 1, in particular Africa

N.B :

1. Finnish Administration might have made similar contribution at the previous conference
2. Monitoring on usages in 800 MHz may impact future discussions on DD2

- DigiTAG is already at work, in cooperation with EBU and BNE, in order to prepare arguments for next main milestones of preparation of WRC 2012 within CEPT and ITU
 - Economical and societal value of DTT,
 - developing DTT(HD, 3D, VAS) requires spectrum availability
- BNE at board level lobby all relevant key actors and in particular EC and MEP (cf BNE event of September 29th, with the participation of DigiTAG, EBU, ACT and Digital Europe)
- Support should be sought from commercial broadcasters (ACT) and manufacturers(Digital Europe), and DigiTAG is to coordinate cooperation between all interested parties in this effort

- ITU WRC-07 added an allocation to the Mobile Service in the 790-862 MHz sub-band as a co-primary service with Broadcasting
 - ❑ Allocation effective from 2015, but can be used from now under conditions
 - ❑ European Commission pushes to go faster and some European countries are already moving so
 - ❑ Protection of GE06 Plan, with its potential for evolution, has to be ensured



Need for protection of DTT from LTE Interferences(down link)

- The facts:
 - ❑ The implementation of MFCN(Mobile/Fix Communication Networks) in the 790-862 MHz frequency band will cause severe disturbance to Digital Terrestrial Television (DTT) Services (in terms of signal to noise degradation and/or overload of TV receiver input stages as well as of antenna mounted amplifiers) unless appropriate measures to eliminate harmful interference are taken by European Regulators and Administrations when awarding frequencies for MFCN in the in the 800 MHz band
- The current regulatory situation is as follows:
 - ❑ EC decision 2010/267/UE related to European harmonisation of the implementation of MFCN in the 790-862 offers in its Annex different levels of protection to limit radio frequency emission from Mobile Base Stations into the TV band, depending on the case considered, according to CEPT Report 30.
 - ❑ Even when the most stringent level of protection, is put in place, interference may occur in the absence of additional mitigation measures (CEPT Report 30 Executive summary, paragraph 6)
 - ❑ The EC decision 2010/267/UE also states that Member States shall ensure that the new systems in the frequency band 790-862 MHz provide appropriate levels of protection to systems in adjacent bands, e.g. DTT services
- Not to be forgotten :
 - ❑ Channel 60 (782-790 MHz) is part of the band allocated to DTT and is already used to deliver DTT Services. Furthermore, Channel 60 is assigned to stations recorded in the GE06 Plan and has to remain fully available for future DTT use(GE06 evolution).

- Protect the consumer receiving conditions from interferences caused by nearby mobile phones



- Estonia and Finland:
 - ❑ Subject of less urgency due to 800MHz band not able to be granted now due to Russian aeronavigation services(but this may partly explain pressure by Finland for getting DigitalDividend 2)
- Germany :
 - ❑ Tender completed without protection clause(MB and PSB suing regulator at court);
 - ❑ Regulator supposed to ensure absence of interference when networks will be deployed
 - ❑ Current trial with ARD and Vodafone
- Sweden:
 - ❑ Current consultation on draft protection clause:
 - protection of channel 60 when used at start,
 - but no further protection so far;
 - possible set up of a body to take care of interferences, managed by MNOs
- UK:
 - ❑ Ofcom working on protection clause:
 - Has undertaken a trial in order to assess validity of theoretical model,
 - contemplates further consultations on draft protection clause
- France
 - ❑ current discussions between CSN/ANFR/ARCEP/CSA:
 - BEM level A should apply everywhere,
 - other protection clauses uncertain, as well as set up of an independant body

- On October 1st, DigiTAG Steering Board has approved a first document aiming at being supported by other organisations involved in the DTT value chain (EBU, BNE, ACT and Digital Europe) for being addressed to Regulators and all parties involved in the process of using 800 MHz band for services other than broadcasting, for the purpose of ensuring protection of DTT Services up to Channel 60 included, from interference resulting from down link
- Further work is ongoing related to interference coming from the consumer devices (handheld and sticked to computers)
- After having reminded the current status of the regulatory framework, and the facts which results from it, here are the recommendations of this document
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- In order to provide an appropriate level of protection to DTT services below 790 MHz vis-à-vis emissions from mobile/fixed communications networks(MFCN) operating within the 790-862 MHz band, **the following measures and protection clauses should be required by regulators at an early stage, prior to the award of licences for use of the spectrum:**
- ❑ **Most stringent level (baseline requirement in case A) defined in EC decision 2010/267/EC has to be applied to all spectrum below 790 MHz everywhere**
 - ❑ **Additional mitigation measures shall be required as necessary** to be put in place by Mobile Wireless Broadband Services license holders to ensure full protection of DTT services. The basis for this protection should be a **pre-emptive and careful network planning by the MFCN operator** to avoid as far as possible situations that may create interferences into reception of DTT. Associated costs of necessary remedies shall not be borne by broadcasters, broadcast network operators or the viewers. Depending on the actual situation, these measures may include but not be limited to:
 - **reducing the power of the MFCN transmitters and adjusting their antenna characteristics** to reduce interference problems taking into account local conditions, in particular for the MFCN Base Stations using the first frequency block above 790 MHz
 - **using an BS antenna polarisation that is orthogonal (opposite) to that of the DTT transmitter** in particular for the Base Stations using the first frequency block above 790 MHz;
 - **use of additional RF filtering at MFCN Base Stations**, in particular for the Bases Stations using the first frequency block above 790 MHz;
 - **use of on-channel low-power DTT repeaters at the MFCN Base Stations** to restore the degradation of signal to noise ratio at impaired DTT receivers. Such remedies should be **closely coordinated with the impacted broadcast multiplex operator**, since it may not always be easily applicable (e.g. in case of DTT transmitters operating in an SFN);

- ❑ The Regulators granting frequencies in the 800 MHz band and their respective Administrations should further consider the following additional measures:
 - **set-up of an independent body** (point of contact) to which cases of interference or loss of DTT service can be reported, to ensure a prompt and effective resolution. In addition this body should have access to the necessary funds and resources to implement appropriate remedies. The response time must be very short – in the order of hours, not days. Pending the implementation of measures for resolution of interference, the source creating it should be turned off.
 - **ensure, or delegate this insurance to this independent body when created, that consumers experiencing loss of DTT service even after mitigation measures mentioned above are implemented, are promptly provided with adequate equipment to allow continued reception of DTT services.** Such equipment may include, but shall not be limited to, appropriate filters in front of the DTT receiver or receiving antenna amplifier system to [\[11\]](#) eliminate harmful interference stemming from emissions in the frequency band 790-862 MHz. In any case, such measures must not impair reception of channel 60. The associated costs of these necessary remedies shall not be borne by broadcasters, broadcast network operators or the viewers.
 - **any other actions necessary** for circumstances when the above measures have proven ineffective

It is further highly recommended that, prior to setting the above protection measures, Regulators and their respective Administrations organise field trials to observe the 'real world' impact of the deployment of mobile/fixed communications services versus the results of theoretical models utilised for prediction.[1](#)

➤ Interference with LTE

- ☐ Look for endorsement/ co signing of the document about down link interferences by other parties of the broadcast industry(EBU, ACT, BNE, Digital Europe)
- ☐ Work on the uplink issue

➤ White Spaces

- ☐ Consultation on SE 43 report

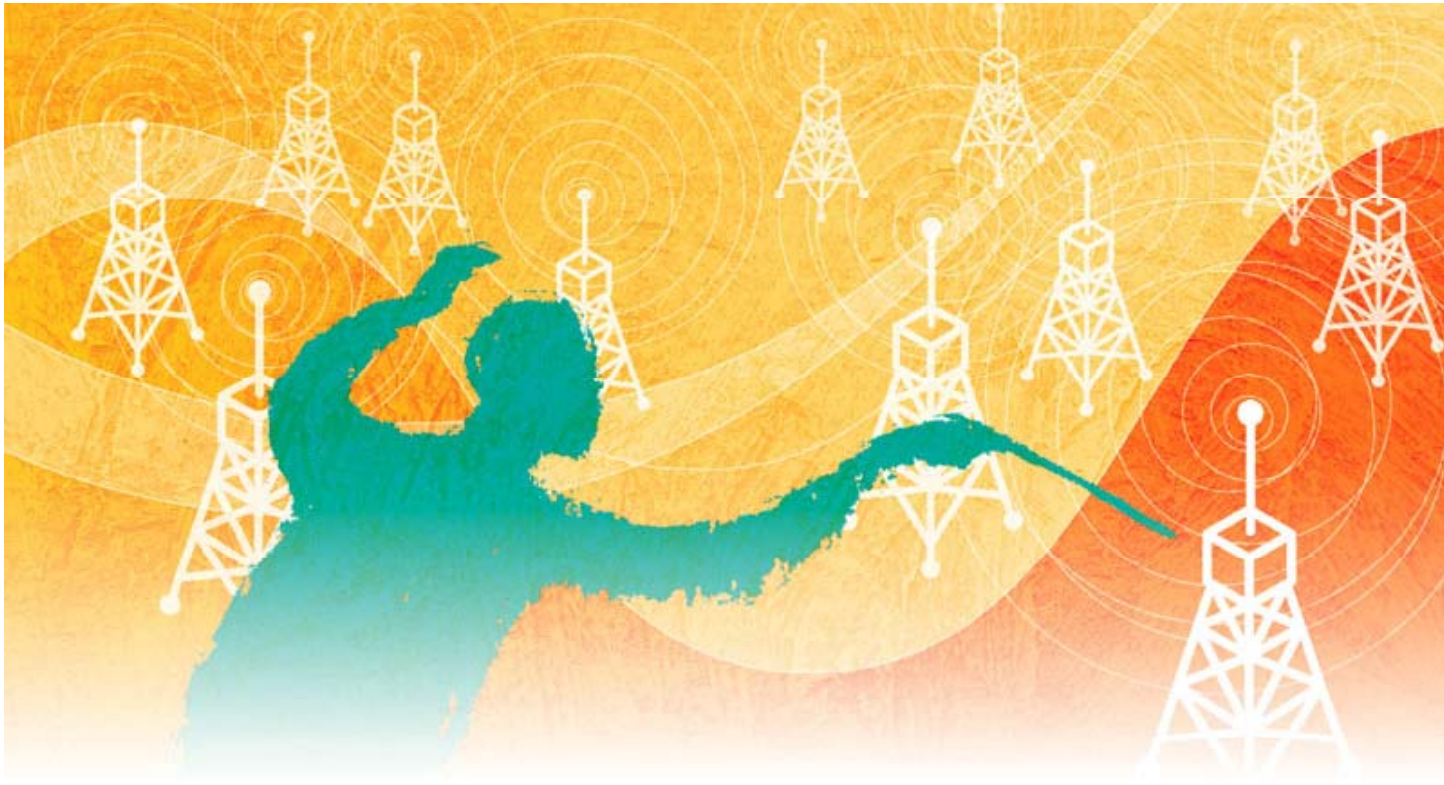
➤ Digital Dividend 2

- ☐ Coordinate with other interested parties for contributing to CEPT CPG

- **Digital Terrestrial Television is the unique platform to provide universal service to all television households**
- **The broadcasting community has made its duty by arranging DTT deployments below 792MHz, so to allow use of Digital Dividend for other services. It has now to ensure its future developments by also making further use of Digital Dividend in the best possible efficient way (combination of smart spectrum management with use of innovative technologies)**
- **Protection of broadcasting services from interferences has to be ensured, as well as prevention of a Digital Dividend 2**

**Let us work and team all together
so to meet these challenges!**

Thank you for your attention



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