

Executive information regarding frequency management issues for DVB-H services

The following is a short executive summary of a comprehensive report on frequency management issues regarding introduction of DVB-H in Europe.

The Broadcasting Service with television and sound broadcasting is going digital and is probably the last major radio service to be digitized. With digital technology the traditional boundaries between radio services such as Broadcasting, Fixed and Mobile are disappearing. Furthermore the digital technology provides for a more efficient use of spectrum. More than 4-5 times as many standard TV programs are possible within the same frequency spectrum.

The new European standard for handheld Digital Video Broadcasting services (DVB-H) is a good example of convergence of services and technologies. Telecommunications administrations and governments in Europe and world wide have are considering DVB-H type of services in the national development of the Digital Terrestrial Television services.

Digital Terrestrial Television services (DTT) have been developed and are operational in 8-9 European countries based on government licenses for 10-15 years.

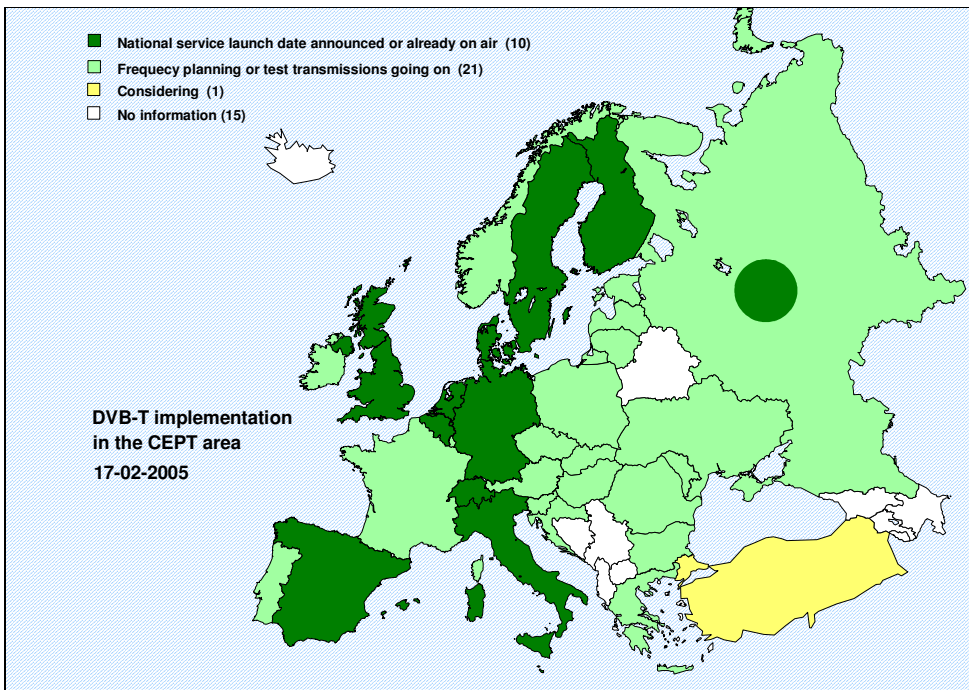


Figure 1: DVB-T implementation in Europe

France has started operational service by end March 2005 and other countries such as Austria – Denmark – Hungary – Lithuania – Slovakia are expected to start DVB-T operation during the year 2005.

Frequency Planning in Europe.

The development and commercial deployment of DVB-H services and IP Datacast technology in Europe is closely related to the planning for and implementation of DVB-T and T-DAB services and the switchover from analogue to digital television.

The ITU regional conference (RRC-06) has been set up to carry out the detailed frequency planning for digital terrestrial television services. The technical background for the planning was agreed at a conference RRC-04 last year and bilateral/multilateral frequency coordination between telecommunications administrations has been initiated. Furthermore 2 rounds of ITU Planning exercises will take place as guidance to administrations to achieve a high degree of pre-coordinated frequency requirements for the ITU-conference.

The RRC-06 will result in a new agreement and associated frequency plans, which will provide an initial legal framework for introduction of digital terrestrial broadcasting systems within the planning area. This frequency plan, however, neither precludes nor limits the results of possible further planning on national, bi and multilateral basis. To this effect regulatory procedures are developed as an integral part of the internal agreement.

The frequency plan is limited to the frequency bands 174-230 MHz (TV-band III) and 470-862 MHz (TV-band IV/V) and will to a large extent be based on Allotment planning in Single Frequency Network (SFN) systems. Allotment planning defines the coverage area and a reference planning configuration which defines the interference potential of the allotment. The planning is based on a spectrum mask concept ensuring technology neutrality. Thus any system or technology can be implemented which does not require better protection nor cause higher interference than a given plan entry.

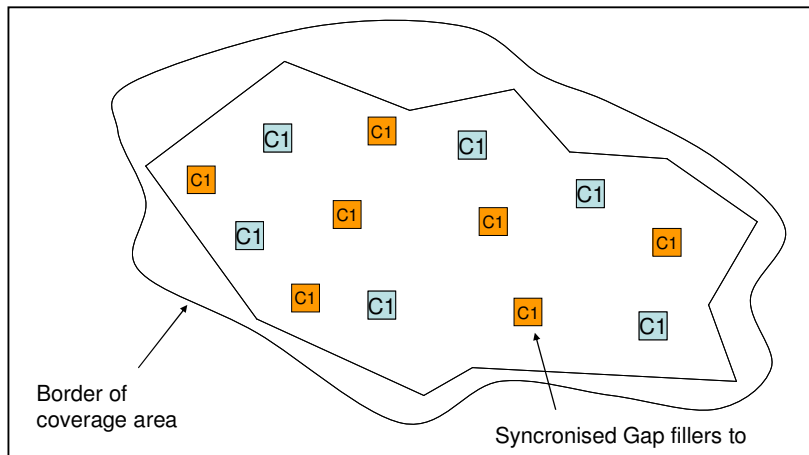


Figure 2: Allotment planning with SFN.

Allotment planning and the mask concept provide increased flexibility in the planning compared to the existing frequency assignments planning in the Stockholm Plan. Increased flexibility provides a good background for introduction of services requiring higher field strength levels such as DVB-H services.

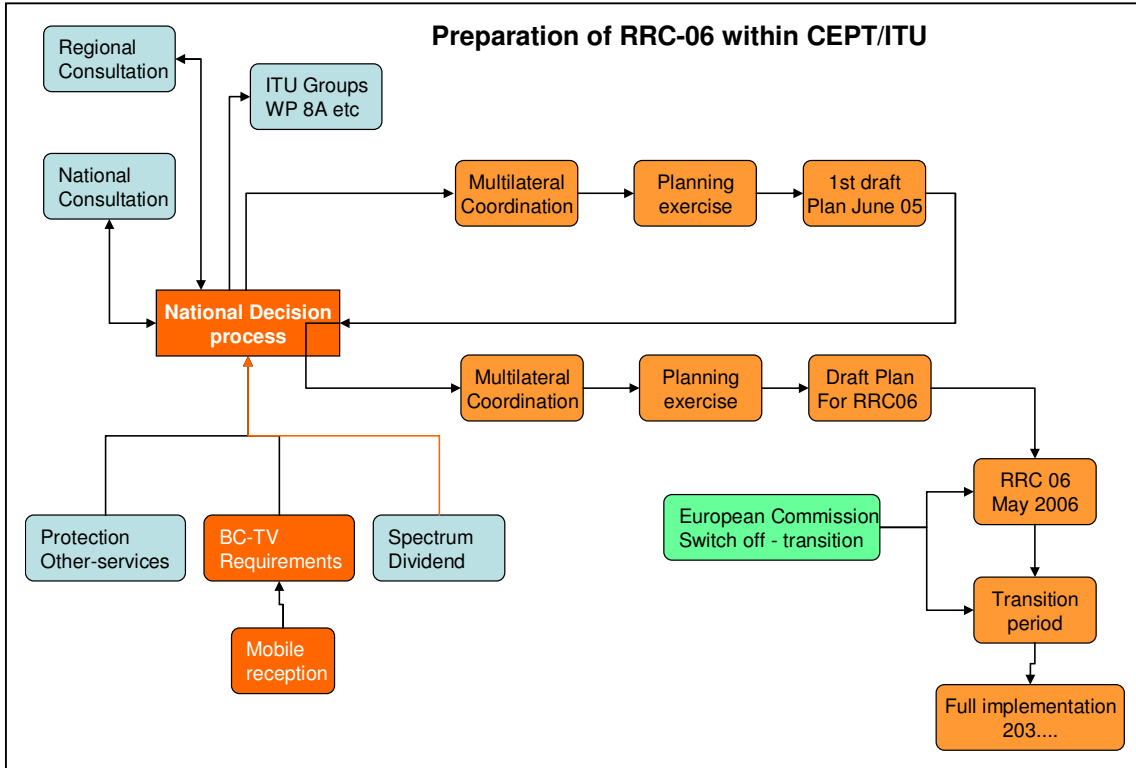
In the initial frequency requirements for the first planning exercise administrations have to a large extent based their planning on fixed reception modes in order to ensure the highest possible number of coverage's and thus an efficient use of the frequency spectrum available. Typically 7-8 coverage's have been required all over Europe.

The need to take into account other services in the frequency bands (Fixed – Mobile- Aeronautical Radionavigation etc) and national restrictions from particular geographic and demographic conditions

complicates the planning process and 12 multilateral coordination and negotiation groups have been established in Europe.

It is of course important that administrations include sufficient flexibility in the frequency requirements to allow for implementation of DVB-H services including planning for portable indoor reception in some part of the frequency requirements.

The frequency planning process leading to the final agreement and frequency plan in 2006 could be visualized as follows:



The national requirements are normally based on a national consultation process where the political level is involved.

Digital switch-over

The digital switch-over that will finally release spectrum from analogue frequency assignments and allow for new and innovative services such as DVB-H have been considered on a European basis within the Radio Spectrum Policy Group (RSPG) of the European Commission in order to achieve possible harmonization in Europe. Common regulations for a specific date was not achieved but the market push in countries such as Italy, Sweden, UK and in particular Germany where digital switchover has been initiated on a region by region basis and the obvious economic benefits from a fast switch-over plan have led to agreements on early dates in other European countries.

European administrations/governments have typically adopted an administrative approach to the timing and mechanism for switch-over in consultation with the traditional broadcasters, public as well as private. Market based approaches to the implementation of digital television is only considered on a very limited scale. The question of implementation is for many European governments not only an issue of technical spectrum use but also a broadcast content issue. This leads to involvement of other ministries than the communications departments and different government policies are applied.

particular service the service might be considered for some sort of trading initiatives after the digital transition.

The benefits of spectrum trading and liberalization for DVB-H type of services is of course dependent on the regulation adopted but in general liberal and flexible approaches to the use of spectrum for DTT would support the introduction and market developments for DVB-H type of services in Europe.

Frequency spectrum available for DVB-H and IP Datacast services.

The RRC-06 conference is only planning for DTT services and therefore the so-called digital dividend resulting for the higher spectrum efficiency of the digital technology is not yet considered in Europe. Some administrations such as the UK have for some time discussed the possible use of the digital dividend and consideration of how to provide a possible return channel has been initiated. A proposal from UMTS Forum and the ETNO to consider harmonization of frequencies for possible non-broadcasting use has not been accepted by the CEPT administrations at this point in time.

It is, however, agreed both within the report from the RRC-04 conference and in the Radio Spectrum Policy Group of the European Union that sufficient flexibility should be included in the planning process in order to also enable electronic communication services other than broadcasting. A flexible planning approach would allow for DVB-H type of services to develop in connection with the implementation of the plan and a strong market potential for DVB-H and IP Datacast services even if full coverage had not been achieved in all countries would provide the necessary market pressure for administrations and governments.

Some administrations including Belgium, Finland, France, Germany, Netherlands, Sweden and Switzerland have indicated that parts of the spectrum requirements could be considered for portable indoor reception modes which would open for new and innovative services such as DVB-H and IP Datacast.

As described above the planning process is in an early stage for many administrations and the question of allowing frequency spectrum and licensing regulations for DVB-H type of services will probably be considered at a later stage in the frequency planning process based on a more clear picture of the spectrum availability for DTT services. Considering the latest developments within the CEPT it is, however, the view of the consultant that spectrum will be made available for DVB-H type of services in most European countries.

The implementation of DVB-H services could be envisaged on a step by step basis where the necessary coverage for DVB-H requiring higher field strength levels than DVB-T is achieved primarily in big cities and close to the established high power television transmitters. Full coverage for DVB-H services would be available at a later stage based on market demands and higher network investments for new gap-fillers. In a number of countries only big cities would achieve coverage for DVB-H even in the medium to long term.

A possible implementation of DVB-H services after the digital transition could be envisaged as indicated below. This information is the view of the consultant and is not based on official information received as only a limited number of administrations have provided such information.

Country	Possible introduction of DVB-H
Albania	Long term
Andorra	DVB-H implemented
Austria	DVB-H implemented
Azerbaijan	Long term
Belarus	Long term
Belgium	DVB-H implemented
Bosnia & Herzegovina	Long term
Bulgaria	Initially in Cities – later countrywide
Croatia	Initially in Cities – later countrywide
Cyprus	Initially in Cities – later countrywide
Czech Republic	Initially in Cities – later countrywide
Denmark	DVB-H implemented
Estonia	DVB-H implemented
Finland	DVB-H implemented
France	DVB-H implemented
FYR Macedonia	DVB-H implemented
Germany	DVB-H implemented
Greece	Initially in Cities – later countrywide
Hungary	DVB-H implemented
Ireland	DVB-H implemented
Iceland	DVB-H implemented
Italy	DVB-H implemented
Latvia	Initially in Cities – later countrywide
Lithuania	Initially in Cities – later countrywide
Luxembourg	DVB-H implemented
Moldova	Long term
Netherlands	DVB-H implemented
Norway	DVB-H implemented
Poland	Initially in Cities – later countrywide
Portugal	DVB-H implemented
Romania	Initially in Cities – later countrywide
Russian Federation	Initially in Cities – later countrywide
Serbia & Montenegro	Long term
Slovakia	DVB-H implemented
Slovenia	DVB-H implemented
Spain	DVB-H implemented
Sweden	DVB-H implemented
Switzerland	DVB-H implemented
Turkey	Initially in Cities – later countrywide
Ukraine	Initially in Cities – later countrywide
United Kingdom	DVB-H implemented



Figure 5: Possible implementation of DVB-H

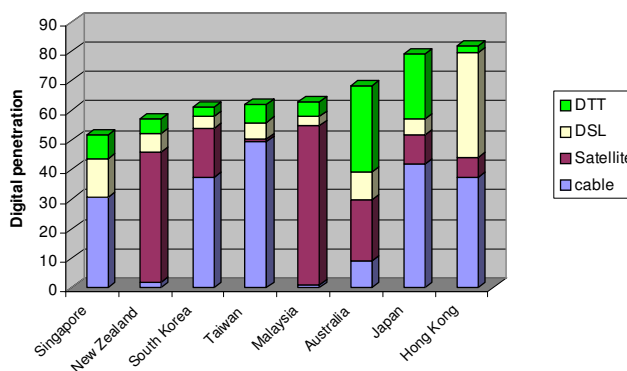
Countries outside Europe.

Frequency spectrum for DTT services is in general available as frequency allocations for Broadcasting including Television have been agreed for many years. Information about the political decision to implement DTT and thus possible DVB-H services is not available from all countries.

In Africa only South Africa and Namibia have started implementation of DTT services and in the Arab Countries this development will probably be limited to the big cities in the initial phase.

In Asia DTT services have been implemented and predictions for 2010 indicate the following division between different platforms.

In China DTT services are developing from 2005 and a complete digital conversion is envisaged by 2015. DVB-H type of services is expected in high density areas.



Conclusions - General issues

1. Frequency management issues for DVB-H type of services are closely linked to the general frequency planning for DTT services and therefore the preparations for the ITU planning conference RRC-06 is important to the introduction of DVB-H and IP Datacast services.
2. The DVB-H type of service is considered a mobile broadcasting service complementary to the DVB-T. DVB-H is part of the existing DVB-T networks and does not need separate and dedicated frequency bands to be reallocated. Therefore DVB-H should be taken into account in the general spectrum requirements for the RRC-06 planning process.
3. The application of DVB-H type of services within the Broadcasting Service is a viable alternative and supplement to traditional TV-broadcasting services to the homes and should be implemented in parallel with the DVB-T services. It is important that information about the opportunities in DVB-H type of broadcasting services is provided to administrations in the planning process.
4. The national regulation and licensing regimes for telecommunications and broadcasting should not hinder development of the DVB-H type of services as complementary to the DVB-T services. These regimes must be sufficiently flexible to allow new services to be developed in close cooperation between the MUX – and mobile operator and the content providers

Prior to the digital switch over

5. In order to achieve the full availability of spectrum for new and innovative broadcasting services such as DVB-H an early transition from analogue to digital broadcasting would be an advantage
6. Administrations should be invited to allow implementation of DVB-H type of services prior to the digital switch-over.

After digital switch-over

7. To achieve a flexible plan at RRC-06 and thus allow implementation of DVB-H services it is important that a sufficient number of allotments or assignments are based on a Reference Planning configuration (RCP 3) with portable indoor reception modes.