



European Broadcasting Union

Technology & Development

Union Européenne de Radio-Télévision

Technologie et Développement

International Telecommunications Union
Radiocommunication Bureau
Geneva

Only by e-mail to: brsgd@itu.int

31 July 2012

DT/81

Dear Sir or Madam,

Response to the questionnaire on spectrum requirements for terrestrial television broadcasting in connection with WRC-15 agenda item 1.2 from the European Broadcasting Union (EBU)

Please find enclosed the response to the questionnaire on spectrum requirements for terrestrial television broadcasting in connection with WRC-15 agenda item 1.2 from the European Broadcasting Union (EBU).

EBU is an industry association representing 85 broadcasting organisations from 56 countries. In addition to this reply, which represents the consolidated and joint view of EBU members, country specific replies will be submitted to the ITU individually by several EBU members.

Yours Sincerely,

For the European Broadcasting Union,

Peter MacAvock
Technology & Development

Annexes: 1

INTERNATIONAL TELECOMMUNICATION UNION



QUESTIONNAIRE ON SPECTRUM REQUIREMENTS FOR TERRESTRIAL TELEVISION BROADCASTING IN CONNECTION WITH WRC-15 AGENDA ITEM 1.2

Name of the Administration/Sector Member: EBU (European Broadcasting Union)

For sector members please indicate the geographical area over which you operate:

Europe and the European Broadcasting Area

Contact person: Walid Sami

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- 1 a) What standards have you adopted for digital terrestrial television broadcasting?
b) Have you started introduction of digital terrestrial television services?
c) If yes, please provide further detail on the number of multiplexes in use, their technical specifications, the percentage of geographic area or population they are intended to cover and the total spectrum use to inform WP 6A.

A proposed format for detailed responses is provided in Annex 1.

Reply:

- a) All European countries have adopted the DVB standard (DVB-T, DVB-T2) for digital terrestrial television broadcasting.
- b) Almost all European countries have started introduction of digital terrestrial television services.
- c) The EBU would like to point out the importance of terrestrial television broadcasting across Europe, while at the same time acknowledging that there is great diversity in the way it is used in different countries. While the number of multiplexes with national coverage varies, in many European countries there are 6 or 7 multiplexes with national coverage. In addition, a number of multiplexes with regional or local coverage are also implemented in most countries.

The multiplexes offer a wide variety of services, depending on the country in which they operate:

- with regard to reception mode: Fixed roof top, portable outdoor/mobile, portable indoor
- with regard to picture format: SDTV, HDTV
- with regard to access: Free-to-air, Pay-TV
- with regard to type: Public service, Commercial service

This diversity of approach to the use of DTT results in considerable variation in the number of programmes offered in different countries. In many countries, there are around 30-40 programmes and in some countries it is as high as 70-80 programmes. Additionally, in several countries, radio services are also carried by the DTT platform.

The DTT multiplexes/layers mentioned above are mostly implemented using channels in the

UHF band 470-790 MHz. However, a few countries use channels in the VHF band 174-230 MHz and some countries are still using channels in the 790-862 MHz band. The whole 470-790 MHz band, including the 694-790 MHz band, is intensively used.

- 2
- a) Have you commenced analogue television switch-off?
 - b) If you have any such plans, when do you expect to have completed the analogue switch-off process?

Reply:

- a) Most European countries have already commenced analogue television switch-off.
- b) Most European countries have completed or plan to complete the switch-off process before the end of 2012. Some countries, especially in Eastern Europe, will however need more time to complete the process. For detailed information, refer to the individual responses to the questionnaire.

- 3
- a) What is the percentage of viewer uptake of terrestrial television in your country, including those whose service provider uses terrestrial broadcast re-transmission (e.g. in cable networks)?
 - b) If possible, please also provide details of the number or proportion of users who receive television primarily by terrestrial means.

Reply: See Annex

- 4
- a) Indicate how many analogue television transmitters use channels in the frequency sub-band 694-790 MHz (as indicated in Resolution **232 (WRC-12)**).
 - b) How many are in the remaining part of the UHF band.

Reply:

- a) As noted in response to question 2 most of the countries served by our members will have completed analogue switch off by the end of 2012. Refer to individual cases where analogue switch off is still in progress for the detailed answer to this question.
- b) See response to a).

- 5
- a) What frequencies/channels are currently used or intended to be used by digital terrestrial television broadcasting in your country? Please distinguish between those in use and those intended to be used.
 - b) If allotments/SFNs are in use, a sketch map of frequency allocations could be included, with an accompanying table of allocations, as shown in Annex 2. Otherwise, it might be possible to show main transmitters and channels, grouped in layers, in a table.
 - c) Please indicate how many digital television assignments/allotments use channels in the frequency sub-band 694-790 MHz (as indicated in Resolution **232 (WRC-12)**), and
 - d) How many are in the remaining part of the UHF band.

Reply:

The EBU has considered responses from various countries and obtained the following results:

For those countries which have already envisaged the release of the 790 - 862 MHz band, between 25% and 35% of actually used and planned frequencies are in the 694 - 790 MHz band.

The 694 - 790 MHz band (ch49 to ch60) comprises 30% of the 470 – 790 MHz band (ch21 to ch60). This means that the 694 - 790 MHz band contains a roughly proportional share of all entries for most of the countries – that is to say that most countries will lose around 30% of their actually used and planned frequencies. In all countries those frequencies affect almost all coverage layers.

In most countries the effect of a re-allocation of the 694 - 790 MHz band would be equivalent to the loss of at least two full national layers. In addition, regional and local multiplexes will be affected.

- 6 a) Are those frequency bands also shared with other primary services?
b) If yes, please give details of those systems and their spectrum use.

Reply:

- a) In most of the European countries, the 470-790 MHz band is not shared with other primary services. However, in some European countries, part of this band is shared with the Aeronautical Radio Navigation Service.
b) For detailed information, refer to the individual responses to the questionnaire

- 7 a) Are those frequency bands also shared with secondary services such as PMSE (Programme Making and Special Events), radio astronomy or wind-profile radar?
b) If yes, please give details of those systems and their spectrum use.

Reply:

- a) In all European countries the 470-790 MHz band is shared with PMSE as secondary service, mainly for use by wireless microphones. In some European countries this band is shared with the radio astronomy service and/or with wind-profile radars.
b) For detailed information, refer to the individual responses to the questionnaire.

- 8 a) Do you foresee the adoption or expansion of television services broadcast using second-generation systems such as DVB-T2?
b) If yes, please give indicative details of the planned transition, including any simulcast period.

Reply:

- a) EBU member organisations foresee an increasing use of DVB-T2. Some have started using it. They however stress that for those cases where services have already been introduced using DVB-T, there is a need for a relatively long transition period during which simulcast is required. Adequate spectrum will be needed to enable the transition.
b) For detailed information, refer to the individual responses to the questionnaire.

- 9 a) Do you foresee a requirement for new and enhanced services, including HD and 3D television, on the terrestrial television platform?
b) If yes, please give indicative details of the number and nature of services planned, and if known, the expected timeframe for their introduction.

Reply:

- a) In many countries, HD programmes are already offered on the DTT platform, and this is expected to become the norm in the short to medium term. In the longer term, EBU expects 3D and UHD TV services to be available on the platform as well.

b) For detailed information, refer to the individual responses to the questionnaire.

- 10** a) Are there plans in your country to launch more multiplexes in the future?
b) If yes, how many more and when? Please also indicate the expected timeframe for their introduction.

Reply:

- a) In most countries the DTT platform is still developing. More multiplexes may be launched and existing multiplexes may have their coverage expanded.
b) For detailed information, refer to the individual responses to the questionnaire.

- 11** a) What is the amount of spectrum you foresee that will be required for terrestrial television broadcasting, if plans in Questions 8, 9 and 10 are to be supported, and services identified in Questions 6 and 7 are to be taken into account? Please indicate the modes of transmission that will be used, and timeframes.
If appropriate, a suggested form to express these requirements is shown in Annex 3.

Reply:

As indicated in the answer to question 9, in many European countries, HD programmes are already offered on the DTT platform, and this is expected to become the norm in the short to medium term. In the longer term, EBU expects 3D and UHDTV services to be available on the platform as well.

The introduction of these services will require enhanced coding technologies (e.g. H.264/AVC or later H.265/HEVC) as well as enhanced modulation technologies (e.g. DVB-T2).

Investigations carried out by EBU have shown that the improvement in coding technology (going from MPEG2 to H.264/AVC) and in modulation technology (going from DVB-T to DVB-T2) will almost allow to upgrade all services from SDTV to HDTV, but does not offer capacity for additional services (see estimation of gains provided by enhanced technologies in [EBU Technical Report 15](#)).

Further gains arising from the introduction of e.g. H.265 will be used to offer 3D and UHDTV programmes on the terrestrial broadcasting platform, providing increased value to audiences. Without such incentive, there would be no reason for the public to upgrade to H.265 receivers.

These new technologies need to be introduced in parallel with the existing ones to give consumers the chance to invest in new equipment according to their wishes, while the existing services are maintained during a transition period with simulcast transmissions. DTT technology and services can be expected to further develop in the future, thus creating recurrent needs for upgrades and simulcast of existing services.

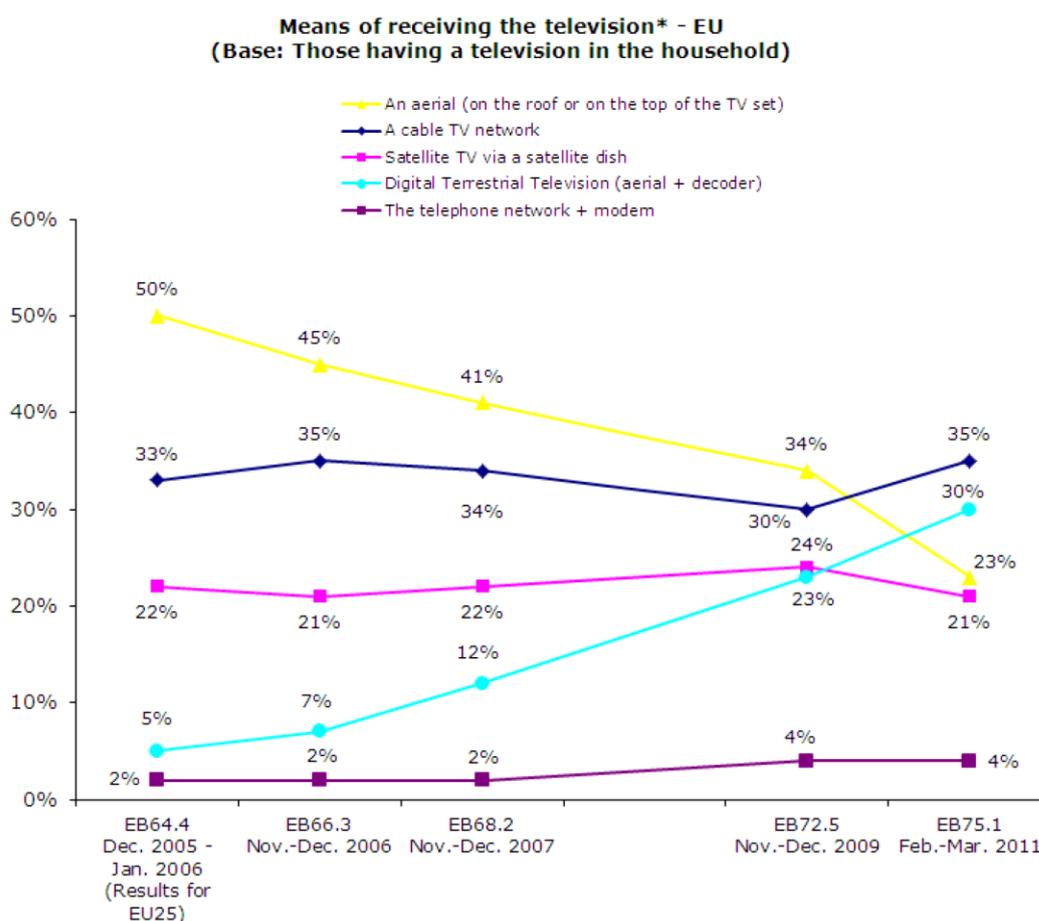
EBU therefore concludes that the spectrum required for DTT broadcasting in Europe will remain as it is today, i.e. including the 694 – 790 MHz band.

Guaranteed access to this spectrum is needed to provide certainty to broadcasters and the industry alike and encourage further standardisation work and investments in enhanced technologies for service delivery.

ANNEX – REPLY TO QUESTION 3

Terrestrial television has undergone tremendous development through the introduction of digital technology in the networks. The uptake of DTT is steadily growing and the terrestrial platform remains very important for television distribution in the vast majority of European countries. According to the latest data available, 53% of EU households rely on terrestrial networks for their TV reception (see Figure 1 from [1] Special Eurobarometer 362, July 2011, the addition of the figures for analogue and digital terrestrial television gives 53%). It should be noted that DTT utilization varies significantly with the type of areas, in particular high usage is noted in urban areas (see [2]), and between countries. Some countries have over 80% DTT viewer uptake. DTT is a very successful platform, equally supported by broadcasters, network operators, the manufacturing industry and the public.

Figure 1

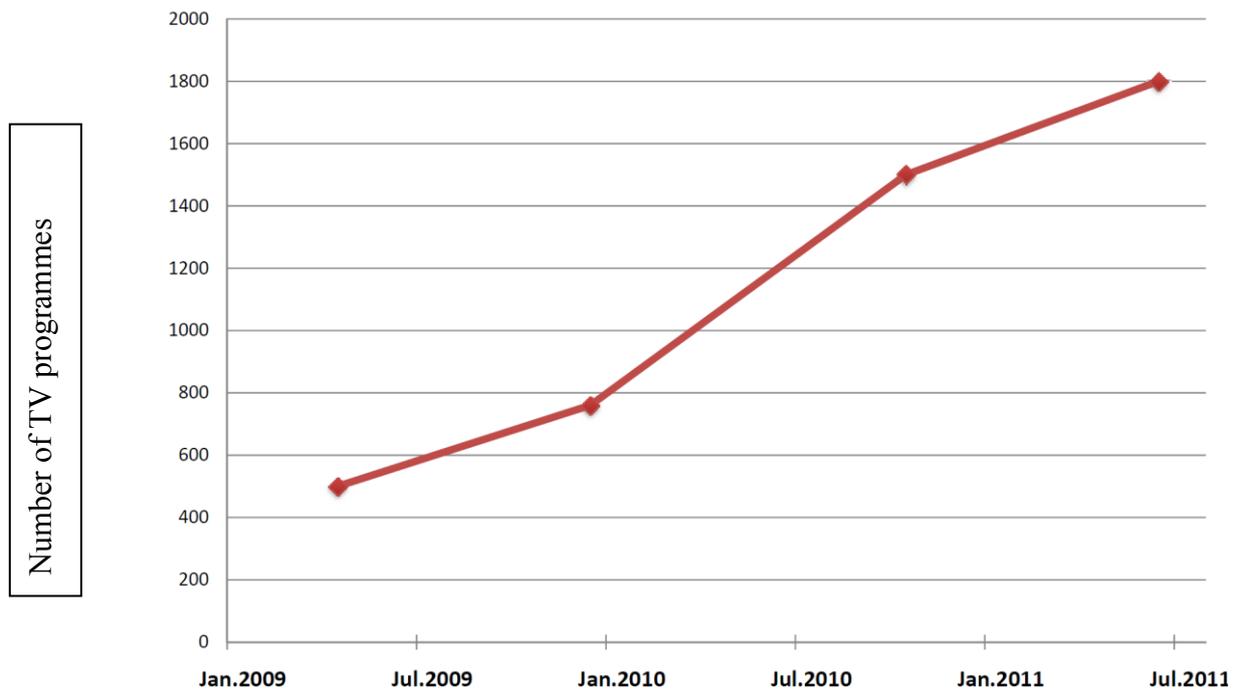


Source: Special Eurobarometer 362, July 2011. For clarity: the yellow line corresponds to analogue terrestrial broadcasts

DTT has been established with different time scales across Europe. The first operational DTT networks were introduced in some countries in 1999 while there are countries in Europe where DTT is still in an early stage of development. Analogue switch-off has not yet been finalized everywhere. To be sustainable in a competitive market DTT needs to provide a wide and attractive programme offer and meet expectations from viewers on audio and picture quality.

The total number of programme services on DTT across Europe is steadily growing as a result of the digital switchover and rollout of more spectrally efficient networks (See figure 2 derived from [3]).

Figure 2. Growth in Number of TV Programmes on DTT networks in the European Union



Source data: Mavise TV database (www.obs.coe.int/about/oea/pr/mavise_juin2011.html)

Linear TV is still a highly popular service. In 2011 the average worldwide daily viewing time stood at 3 hours and 16 minutes per person per day, an increase of 6 minutes in comparison with 2010. This increase was notably supported by Asia and especially China which registered a strong growth of +12 minutes in one year. Similar increases were also reported in several European countries, with +15 minutes in France, +7 minutes in Italy and +5 minutes in Spain (See [4]).

References:

[1] Special Eurobarometer 362, July 2011

(<http://www.eubusiness.com/topics/telecoms/eurobarometer-362>)

[2] Digitisation 2010 - Broadcasting gearing up for the internet - the changing face of structures and actors - published by Commission on Licensing and Supervision (ZAK) of the German media authorities- (http://www.die-medienanstalten.de/fileadmin/Download/Publikationen/Digitalisierungsbericht/2010/Digitalisierungsbericht_2010_english.pdf)

[3] Mavise TV database (<http://mavise.obs.coe.int/>)

[4] Press release Mediametrie – Eurodata TV Worldwide 22nd March 2012

(<http://www.mediametrie.fr/presse/communiqués/la-tv-internationale-transforme-l-essai-en-2011.php?id=628>)