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International Telecommunications Union
Radiocommunication Bureau
Geneva

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

Response to the questionnaire on spectrum requirements for terrestrial television broadcasting in connection with WRC-15 agenda item 1.2 from Broadcast Networks Europe (BNE).

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 Broadcast Networks Europe (BNE).

BNE is an industry association representing the major 15 operating companies of terrestrial transmission networks for radio and TV serving 22 countries in Europe. In addition to this reply, which represents the consolidated and joint view of BNE members, country specific replies will be submitted to the ITU individually by several BNE members.

For Broadcast Networks Europe

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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: Broadcast Networks Europe (BNE)

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

The active area that the trade association serves is the European Union, European Free Trade Area and EU Candidate Countries. In total the organisation represents the interests of 15 major terrestrial broadcast network operators serving 22 countries.

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Q 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.

Reply:

a) A range of standards have been adopted across BNE's members to reflect the local broadcast requirements and to support the content delivery requirements of the local consumer. Across BNEs members the standards in operation include; DVB-T/MPEG2/MPEG4 and DVB-T2/MPEG4.

b) Yes.

c) In the majority of member states that our organisations operate DTT services have been launched. The number of multiplexes in operation varies across the countries served with all network operators delivering multiplexes with national coverage, i.e. greater than 95%. The total spectrum currently in use in the UHF band across the served countries is up to 376[1] MHz.

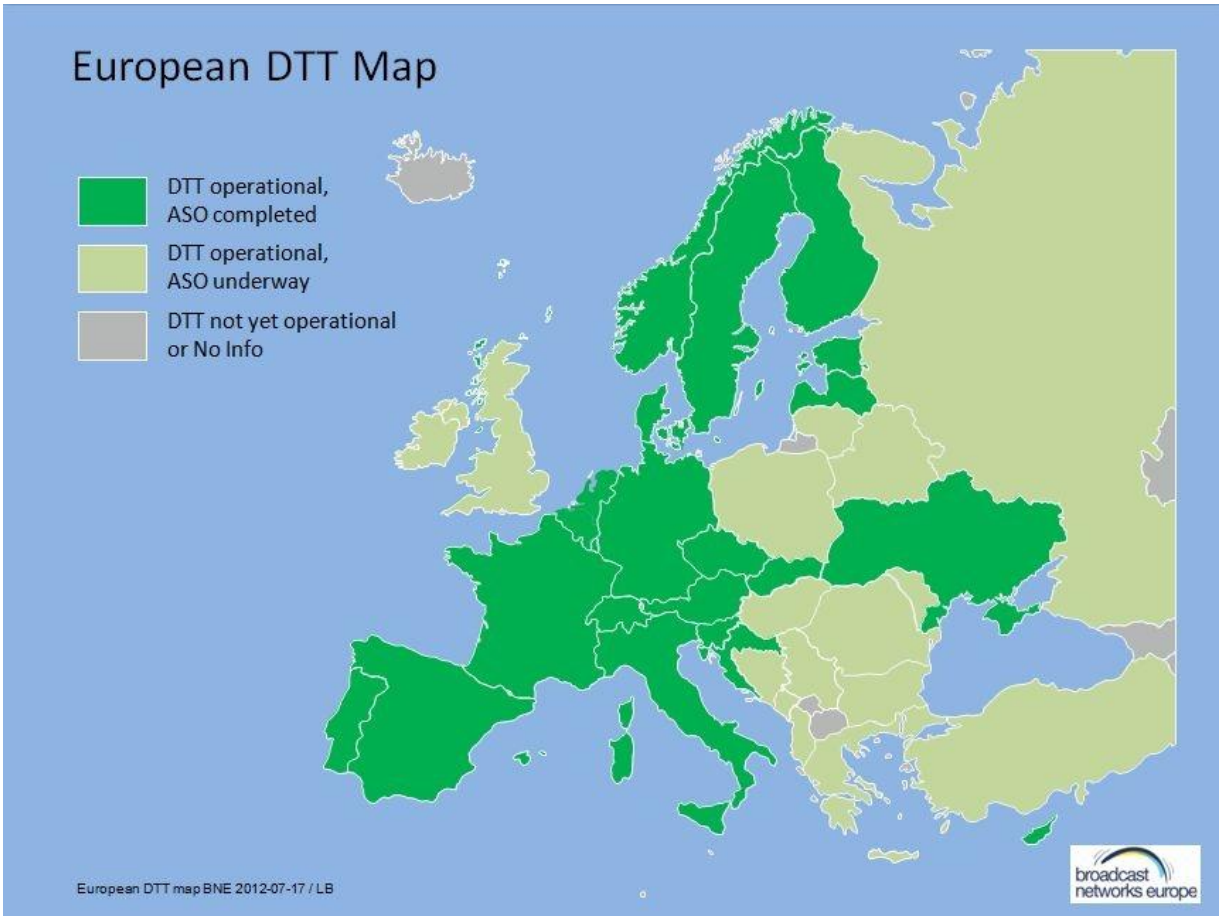
[1] Until 800 MHz clearance completes in 2015 terrestrial broadcast services will be delivered in this frequency range. Post 2015 terrestrial broadcast services will occupy channels. 21 – 60 (320 MHz). In addition, a limited number of countries also utilise VHF spectrum to deliver terrestrial broadcast services but there are considerable technical and economic limitations to the widespread adoption of this band for terrestrial broadcasting.

Q 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) Analogue Switch-off is at various stages of completion across our member organisations. A summary of the current status is provided in the map below; as you can see the vast majority of Western Europe has already completed ASO.



b) Refer to individual member states for the detail against this question. However, most European states have plans to complete ASO not later than end 2015.

Q 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:

a) The proportion of terrestrial television viewing ranges across the member states served by our members and is a function of the local regulatory regime and the countries historic association with terrestrial services. The typical proportion of uptake of terrestrial broadcast services is approximately 50% of viewers, but with some member states having in-excess of 80% viewer uptake. However, if you take account of re-transmission of services via cable and IPTV networks then the level of viewer uptake is considerably higher.

b) Across the European Union 275[2] million people depend on terrestrial broadcast services for daily access to audio-visual content, with daily consumption of services by the consumer of ranging from 2 to 4[3] hrs per day. In addition, 1800+ TV[4] channels are delivered via the terrestrial networks to the consumer enabling diversity of choice and content.

Q 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 the majority of countries served by our members have completed ASO. However, those that are still operating analogue transmitters will be doing so as per the GE06 allocation and any subsequent bi-lateral agreements.

b) Refer to individual member states where ASO is still in progress for the detail against this question.

Q 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.

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[2] Data is based on information from Eurobarometer 362, 2011 and national statistics.

[3] The Communications Report 2012, Ofcom, July 2012, http://stakeholders.ofcom.org.uk/market-data-research/market-data/communications-market-reports/cmr12/

[4] Data from DigiTAG

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:

a) Across the member states represented by BNE's members currently all RF channels (ch. 21 – 69[5]) are used for the provision of terrestrial broadcast services.

b) SFNs are implemented selectively across the member organisations to deliver services in line with the local circumstances. In many cases DTT multiplexers carry national programs with local news and advertising with a country potentially divided into 20-30 technical regions to accommodate such services. SFNs under these circumstances cannot be larger than an individual technical region. In addition, where large SFNs are used more robust modulation parameters may be required to avoid self interference resulting in a reduction in the usable bitrate. Tradeoffs and optimisation of SFNs have to date proven to be country specific.

c) Digital television assignments in the frequency sub-band 694 – 790 MHz are currently widely used across all of our member transmission networks.

d) The remaining part of the UHF band is also extensively deployed for terrestrial television services.

Q 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) No.

b) Not applicable

Q 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) Yes, in the majority of cases PMSE is accommodated as a secondary use.

b) A range of systems are in use;

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[5] Until 800 MHz clearance completes in 2015 terrestrial broadcast services will be delivered in this frequency range. Post 2015 terrestrial broadcast services will occupy chs. 21 – 60 (320 MHz).

- Professional radio microphones and personal monitors
- Temporary audio wideband links
- Full duplex wireless stage intercoms

Typical PMSE applications are low power; 10mW erp for hand-held equipment or 50mW erp for body-worn equipment. Exceptionally, higher powers are required for longer range applications. Most PMSE systems currently use analogue modulation but digital systems are available. Occupied bandwidth is typically up to 200kHz.

Q 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) It depends on the stage of development of DTT in specific countries. \DVB-T2 service introduction has typically been undertaken under two conditions; (i) where DVB-T / MPEG2 services have been in place for a long time and are well established and DVB-T2 has been the means to deliver High Definition services or (ii) for those countries that have only recently launched DTT services and are able to adopt the DVB-T2 standard from the outset.

b) DVB-T2 has only been deployed in a limited number of member networks to facilitate the introduction of High Definition services. There are no plans at present to transition DVB-T networks to DVB-T2 and hence no arrangements have been made for a simulcast period.

Please refer to individual submissions for greater detail on the plans for a DVB-T2 transition.

Q 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) Yes.

b) There is an inherent need for the platform to develop and evolve over time to keep up with competing platform developments and consumer demand. Central to this continued platform development will be an expansion of the range of HD content available (initially HDTV 1080i / 720p and then in due course HDTV 1080p) and in future the provision of services in 3D. The proportion of content that will need to be provided in HD and 3D will be a function of local demand and also proportion of content available in these formats, not all content will

need to be in 3D. In addition other service enhancements will be required by the consumer over time and the DTT platform needs the appropriate amounts of spectrum to afford it the flexibility to provide these services when considered appropriate, e.g. improved audio quality, Ultra High Definition TV (4k HD), services for second screens, and 'over the air' interactive services.

Q 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) Yes.

b) Across member organisations there are a range of plans in place to launch more multiplexes including national, regional and local services on the DTT platform. Across Europe DTT services are very much still in a phase of development with plans / capacity in many countries to launch additional multiplexes as the availability of content grows and consumer demand continues to expand.

Q 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:

a) Taking account of the responses made to questions 1, 8, 9 & 10 above our members are currently utilising ch. 21 – 69 to operate largely DVB-T based networks to deliver National, Regional and Local multiplexes as per the GE06 plan. It is also important to consider the range of service enhancements, see response to question 9, that will be critical to ensuring that terrestrial broadcast services remain competitive and continue to develop to support consumers' demand.

However, whilst the means by which you introduce these service enhancements is likely to initially be via the widespread introduction of DVB-T2 services there is currently no plan to or timetable for the services to be delivered utilising DVB-T2. Furthermore, since the spectrum ch. 21 – 69[6] is extensively utilised to provide existing services it is unclear how such a transition may be facilitated, i.e. where will the additional spectrum for any simulcast arrangements come from and this aspect needs to considered within the long term provision of spectrum for terrestrial broadcasting, i.e. how can platform evolution be taken

[6] Until 800 MHz clearance completes in 2015 terrestrial broadcast services will be delivered in this frequency range. Post 2015 terrestrial broadcast services will occupy chs. 21 – 60 (320 MHz).

account of in future spectrum co-ordination. Finally, whilst a move from DVB-T to DVB-T2 service delivery would provide for spectrum efficiency gains in the long run, in the short term it is very likely that transitional spectrum would be needed to facilitate such a service / consumer migration and such a transition would take a number of years.

The period for transition from DVB-T to DVB-T2 would be different to that involved in the transition from analogue to digital TV where there was a clear benefit to the consumer through additional programme content and choice. In addition there were clear benefits to the broadcast industry to enable innovation and competition whilst the enhanced spectrum efficiency achieved through the migration to DTT delivered the digital dividend spectrum to the Mobile Operators for wireless broadband purposes. No equivalent 'win-win' market outcome would be delivered through a future transition from DVB-T to DVB-T2 and as such it is important that the consequences and costs of such a transition, which are likely to be considerably higher than those associated with clearance of the 800MHz band, be given due consideration taking account of the impact to consumers, the content creation industry and the broadcasters of such a transition. To this end we emphasise the importance of addressing prior to any decision the societal impact of such a future transition from DVB-T to DVB-T2 not just the spectrum optimisation aspect.

Finally, whilst gains associated with a switch to DVB-T2 could make it easier to enable the introduction of the service enhancements described in question 9, the extent to which these services are introduced will determine the long term requirements of spectrum for the provision of terrestrial broadcast services. It is therefore difficult to be definitive over the exact amount of spectrum needed. However, it is likely that the amount of spectrum necessary will not be dissimilar to that which will be utilised after clearance of the 800MHz band, i.e. ch. 21 – 60, recognising that spectrum efficiency gains realised through developments such as DVB-T2 and future higher performing compression standards are likely to be offset by the higher bandwidth requirements of new enhanced services.