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| **Radiocommunication Study Groups** |  |
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| **15 July 2014** |
| **English only** |
| To Administrations of Member States of the ITU, Radiocommunication Sector Members, ITU-R Associates participating in the work of Radiocommunication Study Group 6 and ITU-R Academia |

**Subject**: Questionnaire on spectrum requirements for the future of sound and television broadcasting

**References**: 6/ 93 and 6/249

1 Study Group 6 (SG 6) is the ITU-R Study Group assigned to the Broadcasting service. Its scope covers radiocommunication broadcasting, including vision, sound, multimedia and data services principally intended for delivery to the general public.

2 SG 6 created a Rapporteur Group to look at the future spectrum requirements for the Broadcasting service in light of technical developments, decisions taken by WRC-03 and WRC-07 on the use of digital modulation in the HF Bands, and the changes to frequency allocations at WRC-97, WRC-07 and WRC-12, as part of the work in maintaining its catalogue of Reports and Recommendations.

3 One of the questions that needs to be addressed by SG 6 include how broadcast requirements are changing with the move to digital broadcast systems, and the introduction of new and enhanced broadcast services.

4 The following questionnaire, which is being sent to all Administrations and Sector Members, is designed to gather information on spectrum use by sound and television broadcasting in the bands allocated on a Regional[[1]](#footnote-1) or global basis to terrestrial broadcasting (see Annex 1).

5 Administrations and Sector Members are also invited to make more detailed inputs addressing the matter of current and future spectrum requirements for radio and television broadcasting to the next meeting of WP 6A and SG 6.

6 Administrations and Sector Members are requested to submit responses to brsgd@itu.int by 17 October 2014.

David Barrett

Chairman SG6 Rapporteur Group on spectrum requirements
for the future of the broadcasting Service

QUESTIONNAIRE ON SPECTRUM REQUIREMENTS FOR THE FUTURE OF SOUND AND TELEVISION BROADCASTING

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| **Name of the Administration:** | **Ministry Economic Development Italy** |
| **Contact person:** |  |
|  E-mail address: | **Domenico.spoto@mise.gov.it** |
|  Telephone number: | **+390654444445** |

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| **Name of the Sector Member:** |  |
| **Contact person:** |  |
|  E-mail address: |  |
|  Telephone number: |  |
| **What best describes your organisation?**Commercial broadcaster/Public service broadcaster/ Service provider/ Other (please describe) |  |
| **The geographical area over which you operate:** |  |

**SECTION ONE – Television broadcasting**

1) a) Is your country still using analogue television?

 b) If yes, has analogue television switch-off commenced?

 c) If your country has any plans to switch-off analogue television:

 i) When is the analogue switch-off process expected to be completed?

 ii) How much extra spectrum will be required during the transition phase to digital terrestrial television broadcasting?

**Reply:**

1. **NO**
2. **N.A.**
3. **N.A.**

2) a) Please indicate how many analogue television transmitters are in operation in your country and in which bands.

 b) What channel bandwidths are used for analogue television?

 c) What is the spectrum requirement for analogue television in your country?

A proposed format for responses to question 2a) and 2b) is provided in Annex 1

**Reply:**

1. **N.A.**
2. **N.A.**
3. **N.A.**

3) a) What is the percentage of viewer uptake of terrestrial television in your country?

 b) If possible, please also provide details of the number or proportion of users who receive television primarily by terrestrial means by:

 i) Fixed roof top antenna, or
ii) Portable indoor antenna.

**Reply:**

1. **The current percentage of the Italian population reached by digital terrestrial broadcasting signals is more than 99%.**
2. **The percentage of users who receive television primarily by terrestrial means is around 91% population, by (i) fixed rooftop antenna**

4) If your country has switched or is considering switching to digital terrestrial television broadcasting

 a) What system standard is your country using or considering adopting
(as specified in Recommendations ITU-R BT.1306 and BT.1877)?

 b) When did your country start or when is it proposing to start the introduction of digital terrestrial television services?

 c) Please provide further detail on the number of multiplexes in use, their technical specifications, the percentage of geographic area or population they cover or are intended to cover and the total spectrum use.

A proposed format for detailed responses is provided in Annex 2

**Reply:**

1. **The adopted standard for digital terrestrial television broadcasting is mainly DVB-T and, in minor cases, DVB-T2 (with MPEG-4).**

**Furthermore, MHP standard is currently used for interactivity: more than 10 million Italian DTT receivers are interactive MHP compliant.**

**Adopted Standard for the video of SD programs is MPEG-2.**

**All the broadcasted HD programs are MPEG-4 (H264-AVC).**

1. **Start in 2003 (Transmission analog and digital); begin in 2008 transmission only digital TV**
2. **See Annex 2**

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) Please indicate how many digital terrestrial television transmitters are currently used or intended to be used and in which bands.

 c) What channel bandwidth is used or intended to be used for digital terrestrial television in your country?

A proposed format for responses to question 5b) and 5c) is provided in Annex 1

**Reply:**

1. **In use: VHF: from CH 5 to CH 11; UHF: from CH 21 to CH 60**
2. **See Annex 1**
3. **See Annex 1**

6) a) Are the terrestrial television frequency bands also shared with other primary services in your country?

 b) If yes, please give details of those systems and their spectrum use.

**Reply:**

1. **NO**
2. **N.A.**

7) a) Are the terrestrial television frequency bands also shared with secondary services used for the support of broadcasting such as SAB/SAP (services ancillary to broadcasting/production), or other types of services such as radio astronomy or wind-profile radar?

 b) If yes, please give details of those systems and their spectrum use.

**Reply:**

1. **Yes**
2. **174-223 MHz: SRD (professional radiomicrophones according to ERC/Rec 70-R03).**

 **470-790 MHz:SRD (professional radiomicrophones according to ERC/rec 70-R03)**

8) a) Does your country foresee a requirement for new and enhanced services, including multimedia and data applications, HD, 3D, and UHD 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:**

1. **Yes.**
2. **A number of HD services are already available on DTT platform and experimental 3D transmission were made. There isn’t a national planning of new services but broadcasters foreseen that the number of enhanced program will increase as soon as more frequency spectrum is made available All programs will be at least in HD format with some further programs in 3D and UHDTV formats.**

9) 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:**

1. **Yes**
2. **3 Mux (Resolution AGCOM 277/13- internal digital dividend): 1 already assigned and 2 planned**

10) a) What is the amount of spectrum your country foresees will be required for terrestrial television broadcasting, taking into consideration the responses to Questions 5, 6, 7, 8, and 9? Please indicate the modes of transmission that will be used, and timeframes.

**Reply:**

1. **The frequency planning is in progress and we are awaiting the results of WRC-**

 **15 to define the amount of spectrum really necessary for enhanced TV services**

 **and improved coding systems that will become available**

**SECTION TWO – Sound broadcasting**

11) a) What analogue sound broadcasting standards are used in your country and what bands are they operating in?

 b) Please indicate how many analogue radio transmitters are in operation in your country and in which bands.

 c) What channel bandwidths do they use?

A proposed format for responses to question 11b) and 11c) is provided in Annex 1

**Reply:**

1. **AM in band MF**

 **FM in band VHF II**

1. **See Annex 1**
2. **See Annex 1**

12) a) Is additional spectrum required for growth in the analogue sound broadcasting platform in your country?

 b) If yes, how much additional spectrum is required?

**Reply:**

1. **NO**
2. **N.A.**

13) a) Is your country considering introducing, or has it already introduced digital sound broadcasting?

 b) If yes, which system standards are used or are being considered for adoption (as specified in Recommendations ITU-R BS.1114, BS.1514, BS.1615)?

 c) When did your country start or when does it propose to start digital sound broadcasting?

 d) What channel bandwidths is your country using or considering using?

 e) What frequencies are currently used or intended to be used by digital sound broadcasting in your country? Please distinguish between those in use and those intended to be used.

 f) What is the percentage of the population that is covered by digital sound broadcasting by direct reception in your country?

 g) What additional spectrum was required or is considered to be required for the transition to digital sound broadcasting?

 h) Please indicate how many digital radio transmitters are currently used or intended to be used and in which bands.

 i) What is the spectrum requirement for digital sound broadcasting in your country?

 j) If your country has introduced digital sound broadcasting, how long will it continue to use analogue sound broadcasting?

A proposed format for responses to question 13d) and 13h) is provided in Annex 1

**Reply:**

1. **Yes, it has already been introduced**
2. **DAB and DRM**
3. **DAB already started. DRM planned: it depends on the analogue AM switch-off**
4. **See Annex1**
5. **DAB: Channel 12 on national bases, Ch 7 and Ch 10 on regional bases (Resolution AGCOM 539/13/CONS). For the DRM, frequencies in the range 526.5 KHz to 1606.5 kHz are planned to use**
6. **Currently around 65%**
7. **At present, there is no planning for additional spectrum for DAB.**
8. **See Annex 1**
9. **The forecast is at least 3 DAB blocks for national and up to 11 DAB blocks for regional are required (Resolution AGCOM 664/09/CONS). Around 28 MHz in total.**
10. **Analogue AM switch-off is planned but the data is not yet fixed. Analogue FM switch-off is not yet planned.**

14) a) Are the terrestrial sound broadcasting bands also shared with other primary services in your country?

 b) If yes, please give details of those systems and their spectrum use.

**Reply:**

1. **Yes**
2. **For DAB, the band III is shared with digital television**

15) a) Are the terrestrial sound broadcasting bands also shared with secondary services e.g., used for the support of broadcasting such as SAB/SAP (services ancillary to broadcasting/production), or other types of services such as radio astronomy or wind-profile radar?

 b) If yes, please give details of those systems and their spectrum use.

**Reply:**

1. **Yes**
2. **174-223 MHz : SRD (professional radiomicrophones according to ERC/Rec. 70-R03)**

16) a) What is the amount of spectrum your country foresees will be required for terrestrial sound broadcasting, taking into consideration the responses to the previous questions? Please indicate the modes of transmission that will be used, and timeframes.

**Reply:**

1. **The current development planned for the DAB would require about 28 MHz. The modes are DRM30, T-DAB+, T-DMB**

**SECTION THREE –Multimedia broadcasting**

17) a) Is your country considering introducing or has already introduced multimedia broadcasting?

 b) If yes which system standards is your country using or considering using (as specified in Recommendations ITU-R BT.1833 and BT.2016)?

 c) In which Bands?

 d) When did your country start or when does it propose to start digital multimedia broadcasting?

 e) What are the current and proposed population coverages for digital multimedia broadcasting in your country?

 f) What is the spectrum requirement for multimedia broadcasting in your country?

 g) If your country has introduced digital multimedia broadcasting, please provide further information to describe the system, its implementation and any limitations on its operation.

**Reply:**

1. **Yes, it is considered**
2. **T-DMB and T2Lite**
3. **In bands VHF and UHF**
4. **T-DMB is already stared. T2Lite is in trial**
5. **For T-DMB the current coverage is about 65%.**
6. **The regulation sets for digital radio broadcasted in EUREKA 147 (T-DAB/DMB), that the sound can be enriched with multimedia contents. So the spectrum requirement is the same of digital sound (answer 13.i)**
7. **The regulation sets the limits of usable capacity by each content provider (72 Capacity Units), that includes sound and multimedia contents**

ANNEX 1

Suggested form of presentation of reply to Questions 2, 5, 11, and 13:

A sample response is shown in *Italics* for guidance only.

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| **Country** | **Band** | **Number of Transmitting Stations\*** |
| **Analogue Radio**)(Q11b & Q11c) | **Digital Radio**(Q13d & Q13h) | **Analogue TV**(Q2a & Q2)b | **Digital TV**(Q5b & Q5c) |
| **Channel bandwidth (MHz)** | **MF 9 kHz-****VHF II 300 kHz** | **MF 9-18 kHz****VHF 1.5 MHz** |  | **VHF 7 MHz****UHF 8 MHz** |
| **Italy** | **LF** | 148.5-283.5 kHz |  |  |  |  |
| **MF** | 525-526.5 kHz |  |  |  |  |
| **MF** | 526.5-1606.5 kHz | **12** | **7 planned** |  |  |
| **MF** | 1606.5-1705 kHz |  |  |  |  |
| **HF** | 2.3-26.1 MHz\*\* |  |  |  |  |
| **VHF I** | 47-50 MHz |  |  |  |  |
|  | 50-54 MHz |  |  |  |  |
|  | 54-68 MHz |  |  |  |  |
|  | 68-72 MHz |  |  |  |  |
|  | 76-87.5 MHz |  |  |  |  |
| **VHF II** | 87.5-108 MHz | **16645** |  |  |  |
| **VHF III** | 174-216 MHz |  | **54[[2]](#footnote-2)** |  | **1110** |
| **VHF III** | 216-230 MHz |  | **632** |  | **175** |
| **UHF IV** | 470-694 MHz |  |  |  | **13478** |
| **UHF V** | 694-790 MHz |  |  |  | **5924** |
| **UHF V** | 790-890 MHz |  |  |  | **0** |
| **UHF V** | 890-960 MHz |  |  |  |  |
|  | 1452-1492 MHz |  |  |  |  |
|  | 11.7-12.5 GHz |  |  |  |  |
|  | 12.5-12.7 GHz |  |  |  |  |
|  | 40.5-42.5 GHz |  |  |  |  |
|  | 74-76 GHz |  |  |  |  |
| \* Transmitting stations please include “main stations” and “relay stations.” Please use parenthesis to indicate stations that have still to be brought into use\*\* The bands 3900-3950D, 3950-4000D kHz; the bands for tropical broadcasting: 2300-2498, 3200-3400D, 4750-4995 D, 5005-5060D kHz and the Article 12 Bands 5 900-5 950D, 5 950-6 200, 7 200-7 300, 7 300-7 400D, 7 400-7 450, 9 400-9 500D, 9 500-9 900, 11 600-11 650D, 11 650-12 050, 12 050-12 100D, 13 570-13 600D, 13 600-13 800, 13 800-13 870D, 15 100-15 600, 15 600-15 800D, 17 480-17 550D, 17 550-17 900, 18 900-19 020D, 21 450-21 850, 25 670-26 100. D Resolution 517 (Rev.WRC-07) applies. In the HF bands subject to Article 12 see also No. 5.134. |

**ANNEX 2**

Suggested form of presentation of reply to Question 4: *If your country has switched or is considering switching to digital terrestrial television broadcasting, what system standards is it using or considering adopting? When did your country start, or when is it proposed to start the introduction of digital terrestrial television services? Please provide further detail on the number of multiplexes in use, their technical specifications, the percentage of geographic area or population they cover or are intended to cover and the total spectrum use.*

A sample response is shown in *italics* for guidance only.

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| **Country** | **No of multi-plexes** | **System & modulation** | **FEC** | **GI** | **Reception mode[[3]](#footnote-3)** | **Capacity per multiplex (Mb/s)** | **Current percentage population coverage** | **Intended percentage population coverage** | **Content per multiplex** | **Total capacity(Mb/s)** | **Total spectrum bandwidth used or intended for implementation(MHz)** | **Any additional comments(e.g. duration of licences)** |
| ITALY Public Service (RAI) | 1 | DVB-T, 64-QAM SFN in UHF Band | 3/4 or 5/6 | 1/4 | Fixed | 22.4 – 24.9 | >99.0% | >99.0% | 4 SD MPEG 2 programs + 3 radio programs | 22.4 – 24.9 | (2x7 MHz channels) + 4x8 MHz channels = 46 MHz | Public service broadcaster multiplex with one different regional program for each region |
| DVB-T, 64-QAM MFN in VHF Band | 3/4 | 1/32 | Fixed |
| 3 | DVB-T, 64-QAM SFN in UHF Band | 2/3 | 1/4 | Fixed | 19,9 | >90.0% | >90.0% | x3 MUX: 12 SD MPEG 2 + 1 HD MPEG4 + 5 radio programs | 59.7 |  | Public service multiplexes |
| 1 | DVB-T2/T2Lite in VHF Band | Trial | Trial | Trial | Trial | Trial | >80.0% |  | Not yet defined | 1x8MHz channel |  |
| ITALY (Mediaset) | 1 | DVB-T, 64 QAM | 3/4 | 1/4 | Fixed | 22,4 | > 90 % | > 96 % | 6 SD | 107,1 | 40 | Free-to-air |
| 4 | DVB-T, 64 QAM | 5/6 | 1/4 | Fixed | 24,9 |  94 % | > 94% | 26 SD + 3 HD |  |  | 1 Free + 3 Pay-Tv |

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| **Country** | **No of multi-plexes** | **System & modulation** | **FEC** | **GI** | **Reception mode[[4]](#footnote-4)** | **Capacity per multiplex (Mb/s)** | **Current percentage population coverage** | **Intended percentage population coverage** | **Content per multiplex** | **Total capacity(Mb/s)** | **Total spectrum bandwidth used or intended for implementation(MHz)** | **Any additional comments(e.g. duration of licences)** |
| ITALY PERSIDERA(TIMB+Rete A) | 3 | DVB-T, 64 QAM | 3/4 | 1/4 | Fixed | 22,4 | 95.3 % |  | 7-8 SD + 1 radio | 114,5 | 40 | Free-to-air \*\* |
| 1 | DVB-T, 64 QAM | 3/4 | 1/4 | Fixed | 22,4 | 92.0 % | 95,3 % | 7 SD + 4 radio |
| 1 | DVB-T, 64 QAM | 3/4 | 1/4 | Fixed | 24,9 | 92.0 % |  | 8 SD |
| ITALY (DFREE) | 1 | DVB-T, 64 QAM | 5/6 | 1/4 | Fixed | 24,9 | 91 % | > 91 % | 3 SD + 2 HD | 24,9 | 8 | Pay-Tv |
| ITALY (Retecapri) | 1 | [DVB-T, 64QAM] | ['2/3] | ['1/4] | Fixed | 19,9 | > 80 % | > 85 % | 6 SD + 2 radio | 19,9 | 8 | Free-to-air |
| ITALY (Europa 7) | 1 | DVB-T2, 256 QAM | n.a. | n.a | Fixed | [32] | > 80 % | > 85 % | 4 HD MPEG4 | 32,0 | 7 | Pay-Tv |
| ITALY (Regional -Local) | > 15\*  | DVB-T, 64 QAM | 3/4 typical | 1/4 typical | Fixed | 22.4 typical | > 80 % | > 85 % | 50 SD MPEG 2 + 10 HD MPEG4 + 10 radio programs | 224,0 | > 120 | Mainly Free-to-air |
| ITALY Digital dividend | 3\*\*\* | DVB-T, 64 QAM | ['3/4] | ['1/4] | Fixed | 22,4 |  | > 85 % | t.b.d. | ~ 70 | 24 | Free-to-air |

\* 15 multiplexes for each Italian region, around 450 multiplexes in total

\*\* National TV licensed until 2032; local TV have licences for a period of 20 years

\*\*\* 1 multiplex (digital dividend), assigned and licenced until 2034

1. Regions 1, 2 or 3 as defined in Nos. **5.3** to **5.9** of the Radio Regulations. [↑](#footnote-ref-1)
2. authorized [↑](#footnote-ref-2)
3. E.g. fixed, portable outdoor/mobile, portable indoor. [↑](#footnote-ref-3)
4. E.g. fixed, portable outdoor/mobile, portable indoor. [↑](#footnote-ref-4)