

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

Name of the Administration/Sector Member: Russian Federation

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

Contact person:

Email address:

Telephone number:

- 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 WP6A.

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

Reply:

- a) **DVB-T, DVB-H and DVB-T2 standards have been adopted for digital terrestrial television broadcasting in Russian Federation.**
- b) **Introduction of digital terrestrial television services have been started in 2009 within the framework of national program of Russian Federation. Broadcasting is carried out simultaneously in analog and digital standards.**
- c) **Detailed answer is specified in Annex 1. At the moment digital terrestrial television broadcasting covers almost 45 million people (31.5%) in 41 region of the country (of total 84 regions).**

- 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 television switch-off hasn't been commenced yet.**
- b) **The analogue television switch-off commence is planned for 2015. In accordance with the Concept of TV and Radio broadcasting development in Russian Federation for 2008-2015 approved by Government of Russian Federation on November 29, 2007, the**

analogue switch-off process will be carried out when coverage of digital broadcasting will be equivalent to coverage of analog broadcasting in the given region.

- 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 main means of TV program reception are direct terrestrial reception (50.3% of households) and cable networks, including cable networks which uses terrestrial broadcast re-transmission (31.7% of households).**
- b) **The number of users who receive television primarily by terrestrial means is 82%.**

- 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) **In 694-790 MHz band (49-60 TV channels): 1281;**
- b) **In remaining part of the UHF band (21-48 TV channels): 7474.**

- 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:

- a) **The frequency bands, intended to be used by digital terrestrial television broadcasting in Russian Federation are 174-230 and 470-790 MHz. Band 470-790 MHz (21-60 TV channels) is currently used by digital terrestrial television broadcasting. Band 174-230 MHz is intended to be widely used for digital terrestrial television broadcasting in the future, after the analogue television switch-off.**
- b) **The federal (country-wide) multiplexes of digital terrestrial television broadcasting are based on single frequency networks. Regional and local broadcasting will be developed**

by using single frequency and multi-frequency networks. The table of allotments allocations is specified in Annex 2.

- c) 1438 (21%) frequency allotments of terrestrial digital broadcasting Plan of “Geneva-06” Agreement use channels in the frequency sub-band 694-790 MHz. Frequency band 694-790 MHz is used for broadcasting of 79 single frequency networks (including 1016 television transmitters) of the first federal multiplex, 246 single frequency networks (including approximately 1600 television transmitters) of the second federal multiplexes. It is expected that more than a third of the third multiplex transmitters of regional and local broadcasting will use channels in this frequency band.
- d) Frequency channels in the UHF band below 694 MHz used by 3408 frequency allotments of terrestrial digital broadcasting Plan of Agreement “Geneva-06”. This represents 58% of the total number of frequency allotments of “Geneva-06” Plan in the UHF band.

- 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) Yes, frequency sub-band 694-790 MHz is shared with other primary services.
- b) The characteristics of other primary services (except broadcasting) used in frequency sub-band 694-790 MHz in Russian Federation are presented below:
 - The characteristics of aeronautical radionavigation service (RSBN (air-to-ground), RLS2 type 2 (air-to-ground)) are presented in the document JTG 5-6/180 Annex 5.
 - The characteristics of broadcasting satellite service (networks STATIONAR-T (702-726 MHz) and STATIONAR-T2 (742-766 MHz)) meet the characteristics specified in the Master International Frequency Register.

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

Reply:

- a) The frequency band 470-789 MHz is used for radio microphones (PMSE) as short-range devices.
- b) The characteristics of radio microphones in the frequency band 470-789 MHz are presented below:

Frequencies	Technical characteristics			Channel separation	Additional conditions of use
	Name	Value	Dimension		
470-638	Maximum transmitter	5	mW	200 kHz	Concert radio

Frequencies	Technical characteristics			Channel separation	Additional conditions of use
	Name	Value	Dimension		
MHz	power Maximum antenna gain Harmonized standard	3 EN 300 422	dB		microphones
710-726 MHz	Maximum transmitter power Maximum antenna gain Harmonized standard	5 3 EN 300 422	mW dB	200 kHz	Concert radio microphones

- 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) **There is adopted decision on the application of second-generation TV broadcasting system DVB-T2 in Russian Federation. Digital broadcasting networks being under construction would be implemented using DVB-T2; digital broadcasting networks, which are already operated using DVB-T, now are under conversion into DVB-T2 standard in accordance to the adopted schedule.**
- b) **The period of DVB-T2 broadcasting commencement of services is 2012 year. Simultaneous broadcasting of DVB-T and DVB-T2 systems is not foreseen, except the transition period which may last until 2015.**

- 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, high definition television (HDTV) is intended to be implemented in the third multiplex of digital terrestrial television.**
- b) **Planned services:**
- **The HDTV broadcasting with step-by-step transition to 3D television, timeframe for implementation is 2015-2025.**
 - **The UHDTV broadcasting of some TV programs (sports translation, documentary and feature films), timeframe for implementation is 2025-2030.**

- 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) **The deployment of additional multiplexes is intended after 2015.**
b) **Supposed terms of terrestrial broadcasting multiplexes start are given in the table:**

Terms of implementation	Multiplexes
2015	2-3 standard definition multiplexes (single frequency networks)
2025	2-3 HDTV and 3DTV multiplexes (single frequency networks) 1-2 local broadcasting multiplexes (multi-frequency networks)
2030	1-2 UHD TV multiplexes, for lack of frequency resources - instead of SD multiplexes or local broadcasting multiplexes

In total, operation of 5 - 6 digital terrestrial broadcasting multiplexes expected by 2030.

- 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) **The average minimum estimated amount of spectrum for radio frequency spectrum required for terrestrial television broadcasting at the territory of Russian Federation in the band above 694 MHz is 56 MHz.**

The release of frequencies in the band 694-790 from the terrestrial television broadcasting is possible only through re-planning of broadcasting service in the frequency bands below 694 MHz, with increasing the allowable level of interference for broadcasting networks. In view of this, the measures to re-plan TV broadcasting would be required either on national level or on international level, including sub-regional re-planning and modification of “Geneva-06” Plan, or even revision of “Geneva-06” Plan. Detailed answer is specified in Annex 3.

ANNEX 1

Suggested form of presentation of reply to Question 1: *What standards have you adopted for digital terrestrial television broadcasting? Have you started introduction of digital terrestrial television services? If yes, 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.*

Country	No of Multiplexes	System & Modulation	FEC	GI	Reception Mode	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 ¹ (MHz)	Any additional comments (eg duration of licences)
RUS	1	DVB-T, 64-QAM	3/4	1/4	Fixed	22.3	31.5%	97,6%	9 SD MPEG4	33.2	376, 96 in the band 694-790 MHz	Public service multiplex licensed until 2021
	1 ²	DVB-T2, 64-QAM	4/5	1/16	Fixed	33.2	No data	97,6%	9 SD MPEG4			Public service multiplex licensed until 2021



Annex 1.xls

This table is provided below as an Excel spreadsheet.

¹The total spectrum bandwidth is specified for transition period (simultaneous broadcasting of analog and digital stations).

²Substitute DVB-T multiplex in the most of allotments.

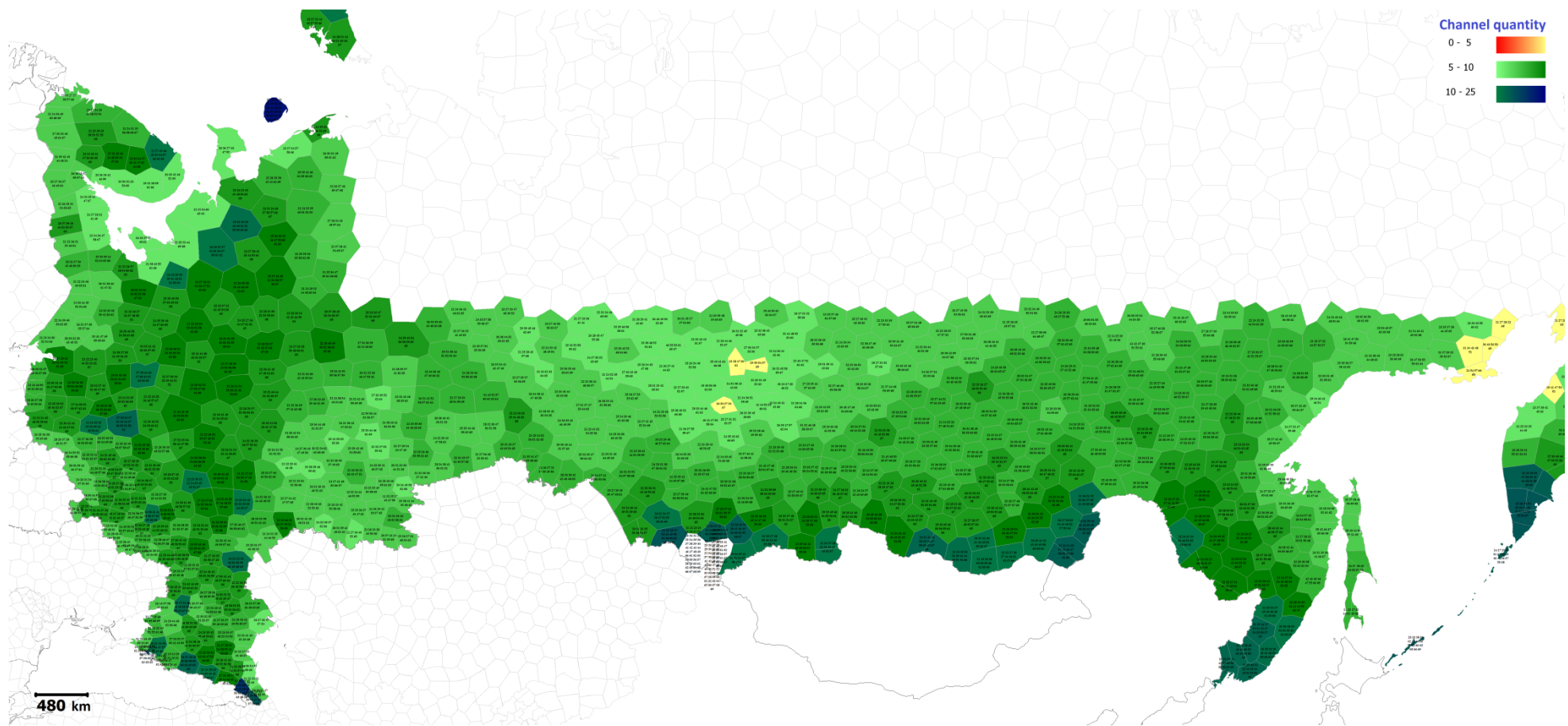
ANNEX 2

Suggested presentation of reply to Question 5: *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.*

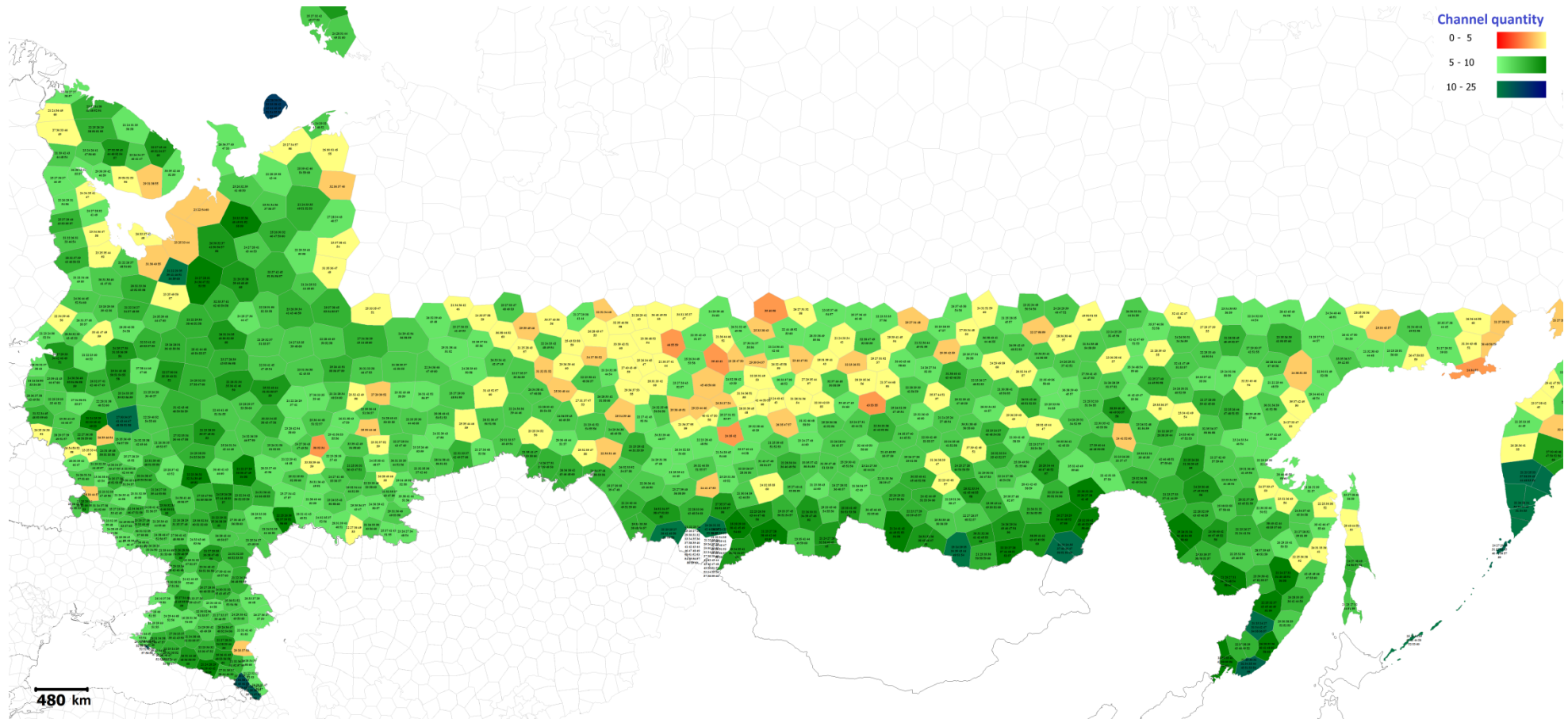


Annex 2.xls

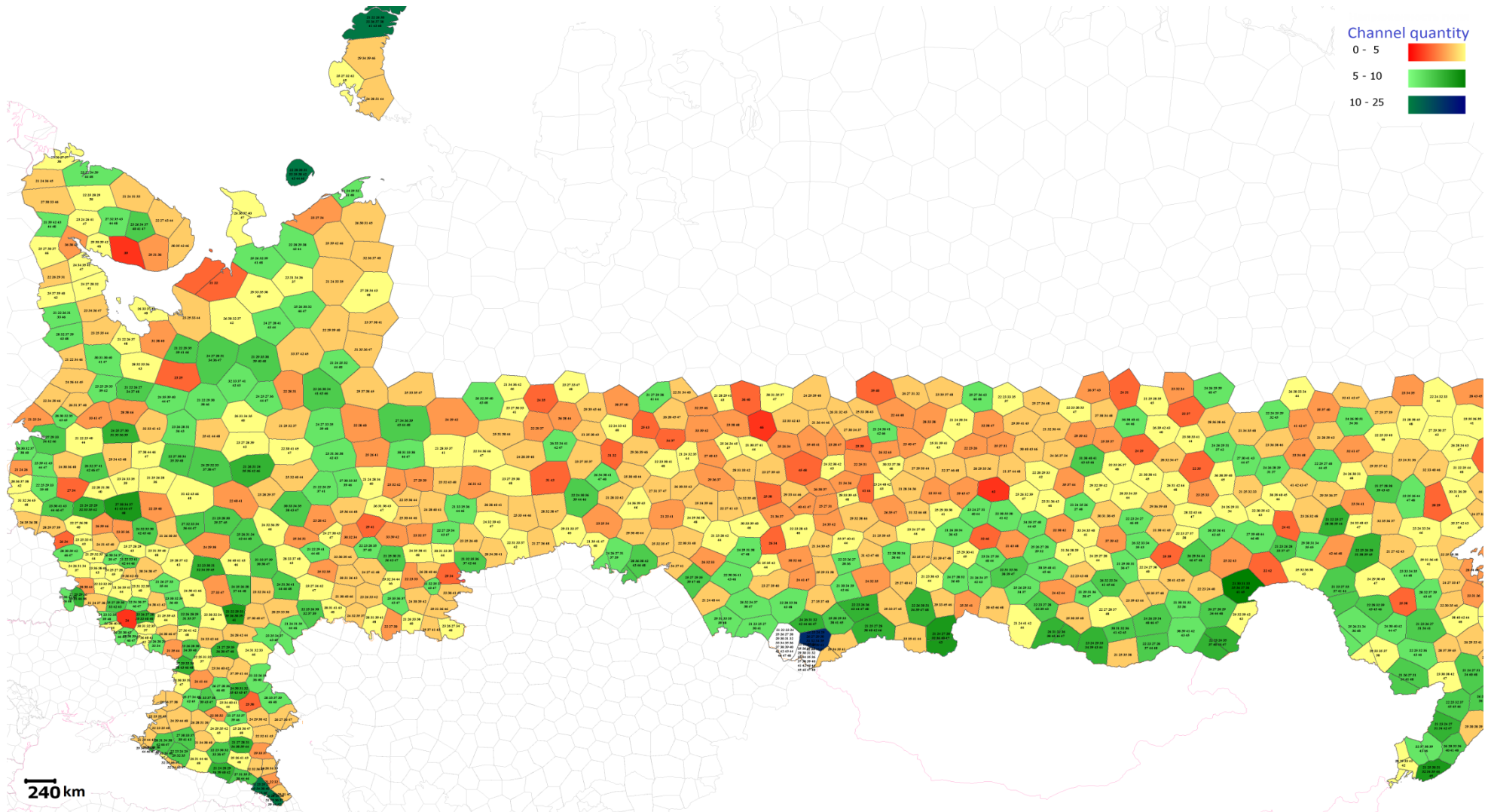
Detailed information of reply to Question 5 is provided in Annex 2.



The map of frequency plan of digital terrestrial broadcasting (the territory is determined by planning area of “Geneva-06” Agreement) in the UHF band.



The map of frequency plan of digital terrestrial broadcasting (the territory is determined by planning area of “Geneva-06” Agreement) on condition of using in the UHF band only frequencies below 790 MHz.



The map of frequency plan of digital terrestrial broadcasting (the territory is determined by planning area of “Geneva-06” Agreement) on condition of using in the UHF band only frequencies below 694 M

ANNEX 3

Suggested form of presentation of reply to Question 11: *What is the minimum amount of spectrum you foresee that will be required for digital terrestrial television broadcasting in Bands IV & V), 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.*

Country	No of Multi-plexes	System & Modulation	FEC	GI	Reception Mode	Capacity per multi-plex (Mb/s)	Intended Percentage Population Coverage	Content per Multiplex	Total Capacity (Mb/s)	Total Spectrum Bandwidth needed (MHz)	Any additional comments including time frames
RUS	2-3	DVB-T2, 64-QAM	4/5	1/16	Fixed	33.2	95%	10SD H.264	199,2 – 232,4	336in sum, 56 above 694 MHz	Federal, to 2015
	2-3	DVB-T2, 64-QAM	4/5	1/16	Fixed	33.2	95%	4 HD H.264			Federal, from 2020
	1	DVB-T2, 64-QAM	4/5	1/16	Fixed	33.2	95%	5 SD H.264 + 2 HDH.264			Regional, from 2015
	1	DVB-T2, 64-QAM	4/5	1/16	Fixed	33.2	55%	5 SD H.264 + 2 HDH.264			Local, from 2020



Annex 3.xls

This table is provided below as an Excel spreadsheet