Summary of responses to the recent Questionnaire on:

The long term spectrum requirements for television broadcasting in the European Union including the number of TV services, HDTV, interactive services, mobility requirements and the possible introduction of Ultra High Definition Television

I. Introduction

The questionnaire was prepared to facilitate the work of the sub-working group of Radio Spectrum Policy Group (RSPG) preparing the draft opinion on the future spectrum requirements for Wireless Broadband, specifically issues relative to the future of the 700 MHz frequency band (694 -790 MHz).

The 700MHz frequency band is currently used in Europe for terrestrial television and in many countries also for PMSE on secondary basis and represents approximately 30% of the total remaining UHF spectrum used by the television broadcasting. The impact of an exclusive reallocation of this spectrum to wireless broadband will therefore be significantly more important for the broadcasting service than in the case of the 800 MHz band.

The responses received to the questionnaire will contribute to the analysis of the RSPG on the future use of the 700 MHz as well as on the evolution of the digital terrestrial platform (DTT) over the next decade (2012 – 2022).

The questionnaire was circulated by the Secretariat of the RSPG on the 24 July 2012, the closing date for responses was the 28 September 2012.

II. Overview of Respondents who participated

Administrations	33
- of which are EU Member States	26
Industry Groups	8
Total Responses Received	41

Thanks to all who took time out to complete the questionnaire, a full list of participants can be found at section IV of this document.

III. Summary of Responses Received

Question 1

i) Please describe the DTT platform in your country, currently on-air, in following terms (please use the following format for your answers):

Some headline findings regarding the existing DTT networks of the countries who responded. Percentages used are as a percentage of the total number of administrations who responded of 33.

(a) number of national DTT networks

One or more national DTT networks in place	28	84.9%
Two or more national DTT networks in place	23	69.7%
Four or more national DTT networks in place	19	57.6%
Six or more national DTT networks in place	10	30.3%
Eight or more national DTT networks in place	5	15.2%
Greater than ten national DTT networks in place	1	3%
Countries whose national DTT services have yet to be rolled-out/launched	3	9.1%
Countries who have no DTT network	1	3%
Countries who have regional/local DTT networks only	1	3%

(b) number of regional/local DTT networks

One or more regional/local DTT networks in place	16	48.5%
Two or more regional/local DTT networks in place	9	27.3%
Four or more regional/local DTT networks in place	7	21.2%
Six or more regional/local DTT networks in place	6	18.2%
Eight or more regional/local DTT networks in place	3	9.1%
Greater than ten or more regional/local DTT networks in place	2	6.1%
Countries who have no or more regional/local DTT networks in place	17	51.5%

(c) DTT System

DVB-T only	25	75.8%
DVB-T plus DVB-T2	5	15.2%
DVB-T2 only	2	6.1%
DVB-H	3	9.1%

(d) Content Format

SD only	10	30.3%
SD plus HD	20	60.6%
HD only	0	0%

(e) Coverage obligations, reception availability

Countries with coverage obligations on one or more of their DTT multiplexes	27	81.8%
Countries with coverage obligations on one or more of their DTT multiplexes	3	9.1%
Countries where one or more of their DTT multiplexes is available on a Free-to-air basis only.	13	39.4%
Countries where one or more of their DTT multiplexes is available on a Free-to-air and pay-TV basis.	16	48.5%

(f) Spectrum Bands used by countries who have DTT currently on-air

UHF Band IV/V only	26	78.9%
UHF Band IV/V and VHF Band III	4	12.1%
VHF Band III only	0	0%

ii) Are there plans to deploy (a) additional DTT multiplexes and/or (b) foresee the launch of new services in the short term (1 – 5 years)?

(a) additional DTT multiplexes

Countries planning additional multiplexes	25	75.8%
- DTT system (DVB-T2)	16	48.5%
- DTT system (DVB-T)	13	39.4%
- DTT system, to be decided	5	15.2%
Content format planned – SD only	3	9.1%
Content format planned – SD plus HD	16	48.5%
Content format planned – HD only	6	18.2%
Content format planned – To be decided	5	15.2%
Countries not planning additional multiplexes	4	12.1%
Countries where decision on additional multiplexes to be taken	3	9.1
Countries planning to reduce the number of DTT multiplexes	1	3%

(b) foresee the launch of new services

Countries foreseeing additional services	25	75.8%
Countries foreseeing no additional services	2	6.1%
Countries where a decision on additional services to be made	4	12.1%
Expected content format – SD only	3	9.1%
Expected content format – SD plus HD	16	48.5%
Expected content format – HD only	7	21.2%
Reception availability – Free-to-air only	4	12.1%
Reception availability – Free-to-air plus pay-TV	7	21.2%
Reception availability – pay TV only	3	9.1%
Reception availability – to be decided	2	6.1%
Interactive Services	10	30.3%
VoD	7	21.1%
Ultra High Definition TV	5	15.2%
Other – 3D TV	5	15.2%

Other services being considered by those countries who selected ‘other’ include mobile services, mobile TV, multi-screen content, Hybrid/Integrated Broadband and Broadcasting (H/IBB).

iii) When do the existing DTT licenses in your country expire?

Expire 2013-2015	5	15.2%
Expire 2016-2019	8	24.2%

Expire 2020-2023	16	48.5%
Expire 2024-2027	9	27.3%
Expire at some point after 2027	3	9.1%
No answer given	2	6.1%
Expire 2016-2026	24	72.8%
Licence renewed annually	1	3%
Expires 2032	1	3%
Don't licence expiration, Government Policy decides	6	18.2%

Question 2

How do you foresee different means of reception (DTT, ADSL, Cable, satellite, etc) complementing each other?

Administrations

Foresee different means of complementing each other	22	66.7%
Do not foresee different means of complementing each other	7	21.2%
Didn't answer/unclear	4	12.1%

Industry Group/Broadcaster

Foresee different means of complementing each other	8	100%
Do not foresee different means of complementing each other	0	0%

Of those countries who believed that different means of reception (DTT, ADSL, Cable, Satellite, Wireless Broadband) were complimentary.

In relation to the role of DTT, administrations and industry groups/broadcasters were of the view that it is an affordable option to provide near universal coverage within a country for free-to-air availability. There was also a general view expressed by some administrations and by industry groups/broadcasters that DTT plays a crucial role in delivering on the political, cultural and social aspects related to public service broadcasting (PSB), given the nature of PSB DTT being available on a free-to-air basis unconditionally and its universal/near universal population coverage.

Some administrations and industry groups/broadcasters were of the view that DTT, ADSL, Cable, Satellite, Wireless broadband were complimentary. DTT provides the free-to-air, universal/near universal population coverage, whereas Cable, ADSL, Wireless Broadband was mainly available in urban areas where the infrastructure supported it. DTT and Satellite cover the areas where cable, ADSL and wireless broadband could not.

Some countries and the industry groups/broadcasters believed that DTT has an important role to play in providing a service to second and third television sets within a household, mainly linear content. Whereas satellite, cable and ADSL, where available, was used on the primary television set within the household, providing linear, non-linear content, as well as interactive services, VoD, where the infrastructure supported it.

Where countries believed that DTT, ADSL, Cable, Satellite, Wireless broadband were not complimentary, this was due to (a) the prominence of cable or satellite, or (b) that DTT, ADSL, Cable, Satellite, Wireless broadband operated in direct competition to within the country and were therefore not seen as complimentary to each other.

Question 3:

i) Do you think that the DTT platform in your country will evolve to being capable of delivering audio-visual services also to mobile terminals?

Administrations

Yes	12	36.4%
No	8	24.2%
Number of Administration where this still under discussion	13	39.4%

Industry Groups/Broadcasters

Yes	7	87.5%
No	0	0%
Still under discussion	1	12.5%

ii) If yes, what is the required evolution of the DTT network platform architecture? Please give details in relation to: -

a. the DTT network topology (whether there will be a need to migrate from high- power/ high- tower to low- power/ low- tower type of networks);

Administrations

Yes/Maybe	8	24.24%
No	5	15.15%
Didn’t answer/under discussion/unclear	20	60.6%

Industry Groups/Broadcasters

Yes	0	0%
No	8	100%

b. to the use of MFN versus SFN networks to achieve the evolution, and

Administrations

MFN	1	3%
SFN	7	15.15%
Mixed MFN & SFN	2	6%
Didn’t answer/under discussion/unclear	23	69.6%

Industry Groups/Broadcasters

MFN	0	0%
SFN	3	37.5%
Mixed MFN & SFN	5	62.5%

c. a possible migration to a new DTT system(e.g. to facilitate interactive services) and transmitting technologies (e.g., DVB-T2, DVB-T2 Lite, etc.).

Administrations

Possible migration to DVB-T2	6	3%
Possible migration to DVB-T2 Lite	1	15.15%
Both	4	6%
Didn't answer/under discussion/unclear	22	69.6%

Industry Groups/Broadcasters

Possible migration to DVB-T2	5	62.5%
Both	1	12.5%
Under discussion	2	25%

iii) Do you believe that a DTT platform evolving towards delivering audio-visual services also to mobile terminals may also be used by mobile operators to cope with:

a. the data traffic required to deliver linear video content (i.e., with mobile terminals including broadcasting tuners), and

b. certain non-linear content that could be pushed (and stored)?

Administrations

Yes	12	36.3%
No	4	12%
Didn't answer/under discussion/unclear	17	51%

Industry Groups/Broadcasters

Yes	6	75%
No	0	0%
Didn't answer/under discussion/unclear	2	25%

iv)What evolutions do you expect would be required for mobile networks to be capable of delivering linear video content ubiquitously to both fixed and mobile terminals?

Administrations

Complementary solution (both DTT and mobile networks co-existing together)	7	21%
Evolved mobile network (LTE Advanced)	7	21%
Evolved DTT network (DVB T2, DVB T2 Lite)	1	3%
Didn't answer/unclear/under discussion	18	54.5%

Industry groups/Broadcasters

Complementary solution (both DTT and mobile networks co-existing together)	4	50%

Evolved mobile network (LTE Advanced)	0	0
Evolved DTT network (DVB T2, DVB T2 Lite)	0	0
Didn't answer/unclear/under discussion	4	50%

Some of the countries stated that for mobile networks to be capable of delivering linear video content to both fixed and mobile terminals the main challenges were:

- the need to ensure sufficient backhaul capacity
- a need for eMBMS devices
- mobile networks not suited to delivering linear video content to a mass audience at same time; better suited to non-linear delivery
- more spectrum needed in any case to support growing demand for mobile data services
- new regulatory framework
- large discrepancy between link budgets for fixed versus mobile networks.

Of those broadcasters who also suggested a complementary solution stated that mobile networks will not become a viable alternative to DTT, instead, the two platforms should be used in a complementary manner which would facilitate their evolution and enhance consumer experience. Furthermore, these respondents presented the following scenarios.

- For big screen, live and linear content, high quality and fixed reception, current DTT networks will remain and evolve to deliver enhanced services e.g. UHD, 3D, etc. Current DTT networks provide a near universal coverage and are optimized for this type of services. Delivery costs on DTT are low and independent of the number of concurrent users.
- For medium / small screen, linear and non-linear content, medium quality:
  - In the case of outdoor reception, a cooperative DTT-Mobile network arrangement would be the optimal approach.
  - In the case of indoor reception, where a vast majority (>80%) of media consumption takes place, innovative solutions such as WiFi offload, and femtocells are some of the possible solutions.
- For small screen, non-linear content, low quality and mobile reception, current mobile network topology seems the optimum infrastructure for low volumes.

v) Of a possible convergence between terrestrial mobile and (evolved) DTT platforms, what do you consider will be the consequences of mobile networks being capable of delivering linear video content to mobile terminals?

A majority of respondents considered it unlikely that mobile networks will evolve to deliver video content to mass audiences, primarily because of the increased demand for spectrum to support such a network capability, which many considered inefficient. Views expressed included:

- It would require a paradigm shift in both the technology and the regulatory framework
- IP based on demand services may increase
- That there may be reduced spectrum for DTT

- Increased competition
- New devices need to be developed
- Mobile network may need to be upgraded
- New business models may be required
- New content/advertising opportunities
- More choice to consumers
- More complex handset
- More spectrum demand
- Increased mobile TV use

Question 4:

i) How many DTT multiplexes do you expect will be needed in your country in the long-term (beyond 2020),

Countries expecting greater than 10 multiplexes required	4	12.1%
Countries expecting less than 10 multiplexes required	20	60.6%
Countries where number of multiplexes required still under discussion	7	21.2%
Countries offering no answer at this time	2	6.1%

In the countries who saw a requirement for more than 10 multiplexes, this included provision for regional/local based DTT services, with numbers ranging from 16 to 55 multiplexes (including national regional/local based DTT services). Of those countries expecting less than 10 national multiplexes the average was 6 national MUXs per country being required beyond 2020.

Of the eight industry groups/broadcasters who replied to this question, the number of multiplexes required ranged in value from 6 to 40.

ii) What services do you expect the DTT multiplexes to carry (assuming use of DVB-T2/HEVC)?

Administrations

SD	6	18.2%
HD	16	48.5%
UHD TV	21	63.2%
3D TV	14	42.4%
Interactive Services	7	21.2%
OTT/VoD	6	18.2%
Number of countries where this still under discussion	7	21.2%

Industry Groups/Broadcasters

SD	1	3%
HD	6	18.2%
UHD TV	7	21.2%
3D TV	5	15.2%
Interactive Services	3	9.1%

iii) What transition and migration paths do you anticipate will be required to achieve this long-term DTT goal for your country?

Administrations

Network migration from DVB-T to DVB-T2	17	51.5%
User equipment migration from DVB-T to DVBT2	14	42.4%
Number of countries where this still under discussion	13	39.4%

Industry Groups/Broadcasters

Network migration from DVB-T to DVB-T2	5	62.5%
User equipment migration from DVB-T to DVBT2	5	62.5%

Of those administrations, industry groups/broadcasters who offered an option about migration paths, some were of the view that cost would also be a factor which needed to be considered. Also, some administrations and industry groups/broadcasters were of the view that securing a frequency re-plan to release the 700 MHz would also be a factor in any migration path.

ANNEX

List of Questionnaire Respondents

(a) Administrations

Name of Administration	EU Member State (Y/N)
Austria	Y
Belgium	Y
Bulgaria	Y
Croatia	N
Cyprus	Y
Czech Republic	Y
Denmark	Y
Estonia	Y
Finland	Y
France	Y
Germany	Y
Greece	Y
Hungary	Y
Ireland	Y
Italy	Y
Latvia	Y
Liechtenstein	N
Lithuania	Y
Luxembourg	Y
Malta	Y
Montenegro	N
Netherlands	Y
Norway	N
Poland	Y
Portugal	Y
Serbia	N
Slovak Republic	Y
Slovenia	Y
Spain	Y
Sweden	Y

Switzerland	N
Turkey	N
United Kingdom	Y

(b) Industry Groups

Name of Industry Group/Broadcaster
Albertis Telecom
Broadcast Networks Europe (BNE)
European Broadcasters Union (EBU)
German Public Broadcasters (ARD-ZDF)
RAI
Media Broadcast GmbH Germany
TDF France
UK Multiplex Operators