

## **Radio Spectrum Policy Group**

### **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**

The questionnaire in **Annex 1** has been 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). This 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 to the questionnaire<sup>1</sup> 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)

For more information on the background to the various elements of the questionnaire see **Annex 2**.

For an example of how to respond to Question 1 please see **Annex 3**.

**Please submit completed questionnaire contained in Annex 1 and return to [zeeshan.nazneen@comreg.ie] by [Friday 28<sup>th</sup> September 2012].**

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<sup>1</sup> The RSPG is aware of the ITU-R WP 6A questionnaire which addresses similar issues and we will if possible try to use responses to that questionnaire to complement the information/views in the draft opinion.

## Annex 1: Questionnaire

### Member State Response details (please complete):

<i>Member State</i>	<i>Name</i>		
<b><u>LUXEMBOURG</u></b>	<b><u>Roland THURMES</u></b>	<b><u>Institut Luxembourgeois de Régulation</u></b>	<b><u>20.09.2012</u></b>

### Question 1 (consider section 1 of Annex 1 to help you with your answer):

(See Annex 2 for example answers for your assistance)

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

<b>Member State</b>	<b>No. of Multiplexes*</b>	<b>Reception availability</b>	<b>Reception mode<sup>2</sup></b>	<b>Number of TV program services and content format</b>	<b>DTT System and modulation</b>	<b>Intended coverage reach<sup>3</sup></b>	<b>Coverage obligation (Y/N)<sup>4</sup></b>	<b>Coverage (as a percentage of population)</b>	<b>Spectrum band used (UHF IV/V or VHF Band III)</b>
LUX	2 channels ( 24 and 27)	Free-to-air	Fixed	8 SD 1 HD	DVB-T, 64QAM	National	No	95%	UHF
LUX	1 (channel 21)	Free-to-air	Fixed	1 SD	DVB-T, 64QAM	National/ regional	No	40%	UHF
LUX	1 (channel 7)**	Free-to-air	Fixed	2 SD	DVB-T, 16QAM	National	No	95%	VHF

<sup>2</sup> E.g., fixed (roof-top), portable indoor, portable outdoor, mobile.

<sup>3</sup> E.g., national, regional, local.

<sup>4</sup> Is there a legislative coverage obligation, e.g., a Public Service Broadcaster.

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\* : please note that due to the size of the country, **1 DVB-T channel** corresponds to **1 national layer** (in a SFN network)

\*\* : the DVB-T channel could be converted into T-DAB channels according GE06

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 (please use the following format for your answers)

Member State	additional Multiplexes (Y/N)	No. of additional Multiplexes	Reception availability	Reception mode <sup>5</sup>	Expected content format (SD and or HD)	Expected DTT system and modulation (if known)	Intended coverage reach <sup>6</sup>	Intended Coverage (as a percentage of population)	Spectrum band used (UHF IV/V or VHF Band III)
LUX	Y	1	Free-to-air	Fixed	SD and/or HD	DVB-T2	national	95%	UHF

**There are no specific projects to migrate to DVB-T2 by the national broadcaster in a short or middle terms. However, they believe at least with regard to the extension of CH21 to national coverage, they could migrate within a period of 5 years to DVB-T2. This is also a question of market demand.**

(b) foresee the launch of new services (please use the following format for your answers)

Member State	Additional Services (Y/N)	Expected content format (SD and or HD)	Reception availability	Expected content format (SD and or HD)	Interactive services (Y/N)	VoD (Y/N)	Ultra High Definiti on TV (Y/N)	Other (Y/N)	If answer Yes to Other, please specify

<sup>5</sup> E.g., fixed (roof-top), portable indoor, portable outdoor, mobile.

<sup>6</sup> E.g., national, regional, local.

**Answer: under consideration**

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

**Answer: In the year 2020.**

## **Question 2**

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

**Answer:**

**One should keep in mind that in Luxembourg about 90% of the households are able to connect to cable TV networks. Furthermore, a governmental strategy for ultrabroadband, initiated in 2010, includes as well IP-TV as one of the services to be expected by fibre connection. As a consequence, a considerable growth to IP-TV is expected in the upcoming years.**

**On the other hand, satellite will certainly remain in future in parallel to complement terrestrial services. DTT can as well play a complementary role to deliver TV broadcasting services, due to the fact that DTT is also suitable for portable/mobile reception and the uncomplicated reception (e.g. via USB-sticks).**

**However, due to the above mentioned reasons and the quite limited numbers of TV channels available for transmission in Luxembourg, it will remain quite challenging for DTT to become more than a niche market. On the other hand, it has to be considered that due to new emerging services such as 3D or UHD TV, large bandwidths are needed even though technology evolutions have been taken into account.**

## **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?

**Answer:**

**In case new transmitting technologies such as DVB-T2 Lite will become a success on European level, Luxembourg will probably as well follow the same direction. It depends also on the business model.**

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

**Answer:**

**In this case, the network topology will presumably migrate to a more cellular structure with low-power/low tower type architecture.**

- 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)?

**Answer:**

**As some new frequency bands will be allocated in Luxembourg to the mobile operators in the near future, it is expected that mobile operators will be capable to carry non-linear content in a more cellular structure to their customers in the upcoming years (unicast).**

**However, DTT platforms might remain the most appropriate architecture to deliver linear video content (multicast).**

**Another aspect to consider is which platform will in future perform the most efficient use of spectrum in terms of bit/s/Hz.**

- 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?

**Answer: under consideration, please see also point ii)**

- 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?

**Answer:** under consideration, please see point ii)

**Question 4:**

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

**Answer:**

For the time being, 4 DVB-T layers are operational in VHF and UHF bands. There are no concrete plans to expand in future, except CH21 which is expected to be extended to national coverage within the next 5 years.

It is quite challenging to predict in a long term view, as the issue is as well market driven and also depending from the development of other platforms (fibre, satellite, cable).

One should also take into account the evolution of other reception modes (please refer to Question 2). In particular, as a consequence of the ultrabroadband strategy by the Luxembourgish government (mentioned above), almost 100% of the households will be connected to fibre in 2020 and thus IP TV will probably become the most significant reception mode, together with cable and satellite. For these reasons, we believe DTT will probably remain a niche offer in Luxembourg as a mobile platform, complementary to IP-TV, cable or satellite.

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

**Answer:**

**Luxembourg believes following services could be provided in future:**

- **ultra HD TV;**
- **3D**
- **linear and non-linear video services taking into account convergence (Connect TV, HBB TV, interactive TV, pay per view, catch up TV)**

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

**Answer:** under consideration