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**Radio Spectrum Policy Group: Draft RSPG Opinion on Strategic Challenges
facing Europe in addressing the Growing Spectrum Demand for Wireless
Broadband.**

1. Introduction

Samsung Electronics is pleased to respond to the public consultation regarding the above draft opinion from the RSPG. In general Samsung agrees with the RSPG recommendations to develop a strategic plan to identify and prioritise the availability of the identified frequency bands for wireless broadband services, but would like to emphasize some aspects on the 700 MHz band and offer a proposal for an additional recommendation relating to the use of higher frequency bands for mobile broadband data delivery.

Samsung Electronics notes that this strategic plan seeks to address the wireless broadband spectrum requirements around 2015 and potentially up to 2020. However Samsung Electronics additionally supports a view that an extended timeframe should take an even longer term view and develop an appropriate plan to specifically consider new spectrum requirements going beyond 2020.

2. 700 MHz band

For the mobile broadband industry perspective, Samsung Electronics considers it beneficial to make the band 700 MHz available for wireless broadband to achieve the objectives of the RSPP and the target of the Digital Agenda of 30 Mbps to every household, but identifies a number of challenges to be resolved, given the fact that the band is used and planned in all European countries for DTT services.

Therefore, Samsung Electronics does not object to reallocation of DTT spectrum for new applications and services in the 700 MHz band provided that the following conditions are met:

- Transitions need to be well managed by governments and regulators (e. g timely, properly resourced and based on accurate frequency planning or

spectrum engineering) and should be developed in cooperation with the Consumer Electronics Industry

- There should be minimum disruption of the existing / legacy broadcast services:
 - o Interference problems should be minimized
 - o There should be adequate communication to consumers
- A harmonized implementation approach across the EU is preferable, even if this could lead to longer timescales for the availability of the band 700 MHz for mobile broadband, as National specificities have to be taken into account.

Samsung Electronics considers a transition to DVB-T2 as an adequate measure to facilitate the release of the 700 MHz band.

2.1 Standards Review

Regarding the proposed review of ETSI and CENELEC standards applicable to DVB-T and DVB-C reception, Samsung Electronics is of the view that a review should be undertaken only once a long term vision with a clear European roadmap for the entire 470 – 790 MHz band has been established:

- Samsung Electronics welcomes the RSPG Opinion to establish a unique long term roadmap for DTT receiver immunity requirements. This would improve product planning security for the CE industry compared to the instability in immunity requirements experienced during the debate on the 790 – 862 MHz band. Samsung Electronics invites the RSPG, EC and administrations to work with the Consumer Electronics Industry on realistic roadmaps and transitions.
- The DVB-C/T/T2 standards were developed on the principle of low cost mass market receivers optimized for a DTT only interference environment. Excessively high immunity requirements may require a fundamental, architectural change of DTT receiver RF components. This represents a significant investment and cost increase for the CE Industry without any return on investments. These costs have to be balanced with the uncertain evolution of DTT, as noted in the RSPG opinion:
 - o The RSPG is envisaging that mandating new technologies will be necessary in some countries.
 - o The mentioned potential emergence of converged/cooperative networks raises uncertainties on the long term evolution of DTT.
- The recognized need for European wide harmonization and a long term planning perspective for the mobile industry is also valid for the Consumer Electronics industry

2.2 Interference Management

Samsung Electronics has contributed to DIGITAL EUROPE's published guideline on LTE interference management¹ and would like to underline some of the aspects covered:

- Complete receiver interference immunity to LTE signals leads to unrealistic requirements.
- Many cases of interference experienced so far with LTE800 are due to components outside DTT receivers (e. g. cables or amplifiers), so that improved receiver immunity is not necessarily the key to good coexistence with mobile services.
- Improved coexistence can be achieved by many means - also by additional requirements and/ or measures on the new entrant spectrum users. From the practical perspective, new entrants can be easily adapted upfront for a better coexistence whilst equipments for incumbent services are always confronted with legacy aspects.

3.0 New spectrum beyond around 2018

Samsung Electronics has no reason to doubt the industry forecasts concerning the explosive growth in demand for wireless broadband services. These services will grow hand-in-hand with developments in terminal equipment and handset capabilities that will lead into new areas of use and new applications that today can only just be envisaged. Device interconnectivity will become ever more pervasive moving into "smart" operations associated with M2M applications and energy usage management (e.g. Smart home / Smart city) and areas such as health care.

Consumers will expect ever faster and seamless connectivity with ubiquitous performance no matter where they are situated.

Samsung Electronics believes that the spectrum required to meet these future demands will need to be found in higher frequencies than those currently under consideration. The higher frequency bands can support wider bandwidth mobile systems allowing more efficient delivery of very high data rate applications and enable self organising networks to backhaul these services.

Frequency bands between around 10 GHz and 40 GHz would seem to strike the right balance and appear most attractive from the technological perspective.

3.1 Enabling Technology

Samsung Electronics believes that developments in materials and manufacturing techniques will facilitate the implementation of intelligent and steerable antenna systems on handset devices. This associated with efficient and high density processing techniques will enable very high speed download capabilities employing new air interfaces dedicated to delivering these services.

Already funding has been made available to establish research programmes that will look at the possibilities to use higher frequencies.

¹ http://www.digitaleurope.org/DocumentDownload.aspx?Command=Core_Download&EntryId=523

3.2 Samsung Electronics' Proposal for the RSPG

Samsung Electronics encourages the RSPG to consider an additional recommendation to extend the RSPP beyond the current 6GHz constraint so that a second phase might consider the use of higher frequencies for wireless broadband. Given the long lead time required to develop the spectrum usage framework, Samsung Electronics believes that is the right time to begin consideration of these frequency bands to send a strong signal to innovators and to complement the research programmes already underway.