

WRC-15 5G Spectrum

DIGITALEUROPE further recommendations for spectrum above 6 GHz

Brussels, 1 October 2015

Background

Over the last few decades, commercial mobile communication has evolved from voice-only to mobile broadband (MBB), enabling a multitude of services including ubiquitous use of the internet and, as a consequence, providing an important contribution to global economic and social development. It is expected that this evolution will continue, and the mobile broadband industry has already initiated studies for development of the next generation of IMT systems that will be a third family member of the IMT family named IMT-2020, but also called 5th Generation (5G) systems, while starting work on demonstrations and trials in Europe and other regions. In response to this development, administrations in Europe as well as in other regions have proposed an agenda item for WRC-19 for possible new allocations of spectrum resources to the Mobile Service and identifications for IMT.

DIGITALEUROPE has previously commented on the need for 5G spectrum from a general perspective; see DIGITALEUROPE's previously published white paper¹ and vision² on this topic. The purpose of this document is to provide DIGITALEUROPE views on the frequency bands/regions above 6 GHz that have been discussed in the different Regional preparatory meetings for WRC-15 and the additional frequency bands/regions that may be of interest.

DIGITALEUROPE has submitted views to the CEPT CPG process for consideration in the development of a proposed WRC-19 agenda item on future spectrum for 5G and DIGITALEUROPE fully supports the inclusion of the frequency range 24.5 – 27.5 GHz in the list of frequency bands/ranges proposed by CEPT. However, as noted in the minutes to CPG (CPG(15)084), there are some views expressed that insufficient attention has been paid to identify bands below 20 GHz. In addition, DIGITALEUROPE is concerned that CEPT will take a vocal position against proposals from other Regions to include the 27.5 – 29.5 GHz band for future studies.

Frequency bands proposed by Regions

Table 1 below summarizes the proposals from the different Regional bodies, noting that ATU does not have a common proposal for 5G. Pending final approval, these proposals will be submitted to WRC-15 as frequency bands to be studied for IMT under a new agenda item. DIGITALEUROPE is pleased to note the general support from the Regions on an agenda item for IMT spectrum above 6 GHz.

Additional proposals may be submitted to WRC-15 in the form of single- or multi-country contributions. It is noted that during the preparatory process of different Regions, various countries and organizations have proposed other frequency bands than those listed in the table below.

1 http://www.digitaleurope.org/DocumentDownload.aspx?Command=Core_Download&EntryId=1011

2 http://www.digitaleurope.org/DocumentDownload.aspx?Command=Core_Download&EntryId=839

Regional Groups	Bands identified in Regional Common Proposals		
	Below 20 GHz	20 – 30 GHz	Above 30 GHz
CEPT		24.5 - 27.5 GHz	31.8 - 33.4 GHz, 40.5 - 43.5 GHz, 45.5 - 48.9 GHz, 66 - 71 GHz, 71 - 76 GHz, 81 - 86 GHz.
APT		25.25 - 25.5 GHz	31.8 - 33.4 GHz, 39 - 47 GHz, 47.2 - 50.2 GHz, 50.4 - 52.6 GHz, 66 - 76 GHz, 81 - 86 GHz.
CITEL	10-10.45 GHz ³	23.15 - 23.6 GHz 24.25 - 27.5 GHz 27.5 - 29.5 GHz	31.8 - 33 GHz, 37 - 40.5 GHz, 45.5 - 47 GHz, 47.2 - 50.2 GHz, 50.4 - 52.6 GHz, 59.3 - 76 GHz
ASMG		-	Bands above 31 GHz
RCC		25.5 - 27.5GHz	31.8 - 33.4GHz, 39.5 - 40.5GHz, 40.5 - 41.5GHz, 45.5 - 47.5GHz, 48.5 - 50.2GHz, 50.4 - 52.6GHz, 66 - 71GHz, 71 - 76GHz, 81 - 86GHz.

Table 1: Bands identified in Regional Common Proposals

Analysis of proposed frequency bands/ranges

The following observations can be made regarding the Regional proposals presented in Table 1:

- A number of bands have been proposed above 30 GHz and there is a certain overlap between the proposals of different regions.
- In the frequency range between 23 and 30 GHz some bands have been proposed, notably 24.25/24.5 – 27.5 GHz and 27.5 – 29.5 GHz.
- Only one band below 20 GHz has been proposed and only for a few countries.

Regarding 24.25/24.5 – 27.5 GHz and 27.5 – 29.5 GHz one should note that, from an implementation perspective, their proximity may provide an important harmonization opportunity which should be further studied in the

³ The band 10-10.45 GHz applies to countries listed in footnote 5.480 ITU-R Radio Regulations of 2012

coming study period of ITU-R. It is thus the view of DIGITALEUROPE that it would be beneficial to have the opportunity to study both these bands for WRC-19.

From the table above, it is clear that the frequency bands in the 6 – 20 GHz frequency range are under-represented. Considering the expected diversity of 5G use cases and the range of new and evolving technological solutions under consideration, this may be problematic in the sense that a change from the use of spectrum below 6 GHz to use of much higher spectrum above 20 GHz may be considered a large incremental step in the 5G systems development process. New techniques such as new waveforms and advanced antenna solutions could readily be deployed in lower frequencies earlier whilst the advanced techniques and solutions for the use of higher bands continue to be developed. Use of the lower bands could provide an intermediate step or bridge towards the realization of the full 5G capability vision which is the final goal. In addition, deployment possibilities may vary considerably from one frequency range to another, depending on propagation characteristics.

Although wider bandwidths could possibly be available above 20 GHz than below, the needs for bandwidth will vary with frequency range and it is expected that a bandwidth below 20 GHz which is in the range of several hundred MHz or more will still be of relevance to 5G deployments. It is also acknowledged that such spectrum may be important to other services and that studies need to be carried out to investigate sharing opportunities with 5G systems. In addition, the spectrum requirements for backhaul should also be considered to assure a good functioning of the overall 5G systems.

Our Recommendations

DIGITALEUROPE is pleased to note that there is good support for an agenda item for IMT spectrum above 6 GHz toward WRC-19 and further notes that there appear to be sufficient alternatives proposed above 30 GHz.

DIGITALEUROPE continues to recommend that studies in a range of frequency bands are needed to satisfy the diverse range of 5G applications and usage scenarios. Spectrum bands in ranges below 20 GHz will be important as well as those between 20 and 30 GHz, between 30 and 45 GHz and above 45 GHz that are already well represented in the Regional proposals.

Based on the above observations of implementation and deployment aspects for 5G systems, DIGITALEUROPE believes that the bands below 20 GHz are under-represented in the WRC-15 AI10 proposals and recommends that further frequency bands/ranges below 20 GHz are studied under the expected agenda item. DIGITALEUROPE also notes that there are several bands with primary mobile allocation in this frequency range, that such bands have been proposed by countries and organisations in the preparatory process for WRC-15 and that an effort should be made to achieve a balance in the availability of 5G spectrum in terms of different frequency ranges, noting that the spectrum in the upper frequency ranges are well represented while very little in the range below 20 GHz is proposed in the current Regional proposals.

Finally, DIGITALEUROPE recommends that CEPT does not take a vocal position against proposals from other Regions to include the 27.5 – 29.5 GHz band and continues to remain neutral on other bands/ranges below 30 GHz proposed for future studies. Indeed, DIGITALEUROPE would like to stress the opportunity for implementation harmonization provided by the bands 24.25/24.5 – 27.5 GHz and 27.5 – 29.5 GHz and thus recommends that both of these bands are kept on the list for this study item.

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ABOUT DIGITALEUROPE

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DIGITALEUROPE ensures industry participation in the development and implementation of EU policies. DIGITALEUROPE's members include 59 corporate members and 35 national trade associations from across Europe. Our website provides further information on our recent news and activities: <http://www.digitaleurope.org>

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