

Deutsche Telekom response to RSPG consultation on the report on “6G Strategic Vision”

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Public

Introduction

Deutsche Telekom (hereafter “DT”) welcomes the opportunity to provide comments on the RSPG report on “6G Strategic Vision” (RSPG24-030 Final). DT would like to thank RSPG for recognizing the importance of developing an appropriate environment for the introduction of the next communication technology 6G, and support its deployment and development in Europe. A crucial factor is the availability of sufficient spectrum resources to enable the European telecommunication industry to invest in infrastructure and to ensure the European competitiveness.

General remarks

The RSPG Report summarizes recent discussions in the RSPG sub-working group, including inputs and opinions from different stakeholders. As anticipated, this Report is providing some strategic cornerstones for the introduction of 6G services in Europe. However, concrete proposals for the development of 6G are missing, in particular those for a timely availability of spectrum resources. Although the Report refers to recent policy initiatives, such as the reports from Mr. Letta and Mr. Draghi calling for urgent actions to improve European competitiveness and stimulate infrastructure investment, it does not describe how to achieve these high level European political goals. DT would like to encourage RSPG to develop a vision to strengthen the European telecommunications industry and enable Europe to be competitive with other Regions, such as China or U.S.

Additionally, DT would like to draw the attention to several parallel RSPG activities, such as strategies on upper 6 GHz and sub-700 MHz with relevance for 6G. DT has the impression that these initiatives need to be better coordinated to work towards the same ultimate goal to support European success on the way towards 6G. DT would like to encourage RSPG to align these activities to best achieve the European objectives.

Besides the following comments DT fully supports the comments from ConnectEurope and GSMA.

Spectrum for 6G

The availability of suitable spectrum resources in low, mid and high bands is essential to enable mobile broadband services that satisfy customer needs. The mobile operators are motivated to deploy the most recent technology as quickly as possible to maximise efficient spectrum use. However, this may be limited by market demand, terminal penetration and rollout obligations. The number of mobile applications and their quality and capacity requirements are constantly increasing. This demand cannot only be served by technical measures and additional deployments, but ultimately needs additional spectrum resources independently from the used technology.

With the development of 6G we will see new use cases which will require network capacity in all frequency ranges. Larger channels, initially with at least 200 MHz continuous channel bandwidth, provide the best foundation for new high-capacity and speed 6G use cases and enable cost-efficient deployments that maximise the benefits to European customers and businesses, both from a competitiveness and environmental perspective. The mid band spectrum must play an important role since only this spectrum range enables such large channels and provides a good balance between its propagation characteristics and the available capacity. This is already valid for 5G, but will become even more relevant for new 6G use cases.

A first important step towards 6G would be the availability of the band 6425-7125 MHz, which is already identified for IMT in Europe. It supports the evolution of 5G as the basis for future 6G deployments. This band allows for larger channel bandwidth, initially with at least 200 MHz and provide the foundation for new use cases. Macro deployments without undue power limitations are key for operators for cost-efficient deployments, bringing most benefits to European customers both from a competitiveness and environmental perspective. However, this is not sufficient to cope with the future 6G capacity demand. If Europe wants to be at the forefront of 6G implementation it needs to be prepared to make additional spectrum available.

This spectrum demand is now partially addressed by the upcoming WRC-27 under agenda item 1.7. Although DT notes that Europe has not supported this respective IMT agenda item at WRC-23, we would like to encourage RSPG to support respective studies to allow the evaluation of any option that would allow for additional spectrum resources for 6G. The frequency range 7125-8400 MHz is of particular interest recognizing that not the entire range is relevant for Europe.

A further opportunity to satisfy the mid-band demand for mobile broadband would be the band 3800-4200 MHz. DT recognizes the current European initiative to harmonise this band for local use. Referring to our comments on vertical use cases below, we would like to encourage RSPG to also consider this band for other usages. Before limiting this valuable spectrum for local networks a demand analysis needs to be done to determine whether the entire 400 MHz range is required. DT sees clear indications that not the entire band is needed for local use and that a part of this band can be made available for public mobile broadband.

Beside the proposed spectrum in the mid-band range there is additional need to enhance the mobile capacity in rural areas and to also improve deep indoor coverage. To reach ubiquitous connectivity and digital equality, the band 470-694 MHz is best suited to address this needs. DT invites RSPG to consider this band when deciding on future 6G resources.

DT welcomes the intention of RSPG to develop a spectrum roadmap. This should be based on the principle of technology neutrality. The roadmap should consider both the already existing capacity needs for mobile broadband but also demands and opportunities for the introduction of future technologies such as 6G. The commonality of the technology generations 5G and 6G is the requirement for large channel bandwidth to address the capacity demand of respective use cases, but also to address the customer expectation of ubiquitous coverage. The RSPG spectrum roadmap should focus on a common timeline for making spectrum available. The timing for spectrum assignments needs to be decided on a national level to appropriately consider the differing market situations.

Spectrum sharing solutions

The report analyses a number of different spectrum sharing ideas. Although DT recognizes sharing as one element of spectrum management, we agree with RSPG that *“It is important to understand and assess all practical performances and shortcomings of various sharing concepts and approaches, and what is required for their generalisation in order to assess any opportunity to apply these solutions in frequency bands targeted for 6G in the future.”*

In addition to a technical evaluation a careful analysis of the socio-economic benefits of sharing solutions is required. Sharing should not be used as a tool to justify and continue inefficient spectrum use. Furthermore, if a sharing solution entails severe restrictions for the shared services, e.g. power limitations or degradation of spectral efficiency, it dilutes the value of the shared spectrum and makes deployments unnecessarily expensive and thus economically unattractive what will also limit

the efficient use of such spectrum. As a result it is far more difficult to achieve the requested service performance and achievement of agreed policy objectives.

In general DT would like to emphasize that sharing is not a specific 6G issues and does not need such a detailed representation in this Report.

Local networks and verticals

As the report correctly summarizes there are a number of solutions to satisfy the demand for local communication services by verticals. DT does not agree that this necessarily entails a relevant demand for spectrum. DT recognizes that solutions to serve vertical use cases include dedicated private networks deployed and operated by verticals themselves. But in reality, a big portion of those networks are provided by public operators using the bands harmonised for mobile broadband. DT does not agree that there is the need for wide-area or national networks for verticals. In this respect the reference to the German approach needs to be corrected. Although the reserved spectrum for verticals in 3700-3800 MHz is available nationwide, each license is limited to the premises of the applicant. And even when counting the 400+ issued licenses at most half of them is really used for industrial networks.

DT acknowledges that there is still the demand for industrial use cases served by dedicated network solutions. However, this should not be translated into reservations of valuable spectrum leading to an inefficient use. Before limiting the band 3800-4200 MHz to low and medium power deployments for local and vertical use cases both a demand but also a socio-economic benefit analysis needs to be conducted to avoid inefficient spectrum use and preventing the use of this band for public mobile services.