

**Deutsche Telekom response to RSPG  
Consultation on the  
“The development of 6G and possible  
implications for spectrum needs and  
guidance on the rollout of future  
wireless broadband networks”**

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## Introduction

Deutsche Telekom (hereafter “Telekom”) welcomes the opportunity to provide comments on “The development of 6G and possible implications for spectrum needs and guidance on the rollout of future wireless broadband networks”. Beside some general comments we would like to provide our view on the proposed recommendations.

## General remarks

At a very early stage of the 6G development RSPG is already engaged in assessing the requirements the new technology generation might have. Telekom appreciates this approach, in particular, the consideration of additional spectrum requirements for 6G. Telekom supports the intention of RSPG to involve all respective stakeholders in the 6G discussions to develop a solid knowledge base on which decisions on spectrum resources can be taken. However, Telekom noted that the provided opinion mostly contains a summary of experiences of current 5G deployments than providing dedicated steps to support future 6G use cases and applications.

Telekom supports the invitation of RSPG to the European Commission to develop a 6G strategy for Europe which facilitates the 6G integration and supports early deployments. This strategy should not be limited to Member States only but to cover the entire European area. Thus Telekom invites the Commission to closely work together with CEPT. As experienced with 5G the definition of a dedicated spectrum strategy by defining prioritized bands for the implementation of a new technology enables an early deployment. Telekom is of the view that a defined time line for making spectrum available would be beneficial whereas the timing of spectrum assignments should be decided on a national basis by considering the specific market requirements.

Beside the following comments Telekom supports the comments from ETNO and GSMA.

## Spectrum for 6G

The availability of suitable spectrum resources in low, mid and high bands is a vital precondition to enable mobile broadband services satisfying the customer needs. The operators are always motivated to deploy the most recent technology in all of their bands to use them as efficient as possible. However, this has limitation due to market demand or obligation which needs to be fulfilled. The number of mobile applications including their quality and capacity requirements are constantly increasing. This demand cannot only be served by technical measures and additional deployment but needs finally 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. The mid band spectrum will play an important role. It provides a good compromise between its propagation characteristics and the available channel bandwidth and enables high data rate outdoor services. This also counts for new 6G use cases. Thus a first important step towards 6G would be the availability of the upper 6 GHz band for the cellular mobile service to enable 5G evolution. This does not solve the demand for additional bands being use for initial 6G deployment.

Telekom noted that RSPG is not supporting a respective IMT agenda item for WRC-27. However, if Europe wants to be at the forefront of 6G implementation it needs to allow for studying opportunities for additional spectrum by involving all stakeholders and evaluating enhanced sharing scenarios which might be part of the new 6G technology solutions. Telekom invites RSPG to rethink their position in this regard. Beside the proposed spectrum in the range directly above 7 GHz for outdoor deployment certain envisaged use case will require spectrum in the THz range at a later stage. This needs also to be considered.

## **Local and vertical demands**

Telekom acknowledges the need for spectrum resources to serve industrial use cases. However, Telekom is of the view that there is no need for dedicated spectrum for local networks or verticals to support their use cases and to enable their use of 6G. As also noted by RSPG there are other approaches than spectrum set-aside to reply to the demand from verticals. Set-asides in harmonized mobile bands lead to an inefficient spectrum use and to a not justified regulatory scarcity. The different vertical use cases can efficiently be solved by mobile networks which can also ensure dedicated resources and enhanced security capabilities. Many vertical use cases benefit from having the opportunity to also access the broad resources of a public mobile network and not being limited to a single frequency band. The vast majority of the vertical use cases could be realized by public mobile networks whereas in particular set-asides lead to fragmentation resulting in negative effects to the public mobile broadband quality preventing from utilizing the specified performance capabilities for the European customers.

## **Non-Terrestrial networks**

Telekom is of the view that contrary to other regions the perspective of Non-Terrestrial-Networks (NTN) for Europe might be limited. European countries already have a very good terrestrial mobile broadband coverage of high quality. Thus, a complementary NTN coverage might be less relevant.

With regard to satellite services, Telekom requests that satellite licences need to be limited to spectrum that is specifically allocated to the Satellite services (FSS or MSS). However, we note recent activities of satellite providers to use LEO satellites in IMT bands where exclusive usage rights have been granted (and bands not being allocated to the Satellite Service) to provide “direct to device” satellite services, establishing connections between standard mobile handsets and satellites. These services are intended to complement terrestrial coverage. However, the terrestrial networks are the primary usage in these harmonised mobile bands. It is important that this use case ensures the protection of terrestrial services. The usage of terrestrial bands or parts of it by satellites needs in any case an agreement with the respective MNO. National administrations are responsible for the compliance with regulatory provisions at country borders.

## **Comments to the recommendations**

The following comments relate to the recommendations proposed in the draft opinion.

### **Recommendation 1:**

Although the definition of 5G pioneer bands supported the 5G implementation Telekom notes that not all the bands are efficiently awarded. In particular, the full 400 MHz in the 3.6 GHz band are not available in all Member States due to set-asides in some countries (e.g. Germany) but also due to cross border issues with non-EU countries. Also in the 700 MHz there are restrictions due to reservations for PPDR or other governmental use. Telekom agrees with the RSPG assessment on the slow uptake of 26 GHz. But also for 26 GHz it has to be noted that some administrations which have already assigned this band limit the available range to just 1 GHz. This does not incentivize operators to invest.

**Recommendation 2:**

Spectrum sharing could play a more important role to ensure availability for mobile but also other services. However, for the provision of high-performance mobile service a certainty for sufficient spectrum at each time is key. Otherwise it is difficult to serve the needs of our customers. So static sharing approaches might be a more appropriate solution than dynamic sharing models. Telekom is of the view that sharing should be in any case be based on commercial agreements between the concerned services/operators.

**Recommendation 3:**

As already stated above Telekom does not see the need for additional spectrum for local networks or verticals although recognizing the need to serve those use cases accordingly. The majority of the use cases in this regard can be served by alternative approaches including mobile networks or unlicensed spectrum. Set-asides in harmonized mobile bands limits the operators ability to provide high-quality mobile broadband services to the customers.

**Recommendation 4:**

Telekom appreciates that RSPG acknowledges the need for additional capacity even before the introduction of 6G. However, we disagree that this could only be served at national level. As outlined before, in some Member States not all of the harmonized bands are entirely assigned. But these missing resources do not solve the capacity needs arising even in course of this decade. Furthermore it has to be noted that the different frequency ranges serve different needs and are not comparable. Therefore Telekom considers additional EU harmonisation of spectrum for mobile services as indispensable. In particular additional spectrum in the mid-band range is required to enable operators to deliver towards the European digitization targets. Telekom invites the European Commission to enable the use of the 6 GHz band for mobile broadband by supporting an IMT identification at WRC-23.

**Recommendation 5:**

Telekom fully supports the continuation of the principle of technology neutrality. The operators have the interest to migrate in all their spectrum bands to the newest and most efficient technology but also need to consider specific market conditions. The development of harmonized technical conditions for 6G supports the availability of a global eco-system and ensures interoperability.

**Recommendation 6:**

As an integrated operator Telekom acknowledges the role of offloading traffic and the role of respective unlicensed spectrum. However, it has to be noted that such systems (e.g. WLAN) do not contribute to the overall broadband capacity but just wireless prolonging the connectivity provided by fixed line access.

**Recommendation 7:**

As already outlined above Telekom believes that NTN solution would only have a limited perspective for Europe due to the already advanced mobile coverage. Any satellite services should be limited to bands allocated to that services.

**Recommendation 8-9:**

Telekom supports the intention of RSPG to further work on a European 6G strategy. An early recognition of the necessary spectrum resources and the definition of consequence actions to be taken to make them available is of outmost importance for a successful implementation of 6G in Europe.