ETNO comments to the RSPG Draft Opinion on the development of 6G and possible implications for spectrum needs and guidance on the roll-out of future wireless broadband networks

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The European Telecommunication Network Operators' Association (ETNO) welcomes the opportunity to provide feedback to the Draft RSPG Opinion on the development of 6G and possible implications for spectrum needs and guidance on the roll-out of future wireless broadband networks.

In the first section, ETNO provides generic views to a selected set of topics relevant to the Draft Opinion, and in the second section, comments to the proposed recommendations are provided.

1. General comments

ETNO welcomes RSPG engagement on an early assessment on the demands for the 6G, in particular the demand for additional spectrum resources. We support the idea of RSPG continuing the exchange and sharing information and experience in this respect. The provided Draft Opinion could be seen as a first attempt to achieve an initial understanding on the requirements for making the new envisaged technology generation a success for Europe.

However, ETNO notes that the Draft Opinion mostly covers the 5G development in Europe but misses the opportunity to provide clear steps for supporting 6G use cases and needs from the radio spectrum perspective. This is also reflected in the recommendation section which actually mainly contains observations rather than recommendations.

Only one very high-level recommendation invites the EC and Member States to develop a 6G strategy to facilitate the timely launch of 6G services across the EU based on the RSPG recommendations. To enable EU to build on this, we urge RSPG to carefully consider the 6G development, in particular the 6G research linked to use cases, traffic increase and spectrum demand.

Furthermore, ETNO appreciates RSPG recognising the role of 5G pioneer bands for enabling 5G deployments in the EU, and especially the importance of the 3.6 GHz band as a primary band for 5G. We believe that 6G could benefit from a similar approach with the identification of frequency bands being made available/prioritised for initial 6G deployments.

a) New spectrum

5G has the potential to deliver a significant amount of value to the European region. However, as data use expands, additional spectrum capacity will be required to satisfy demand for mobile broadband and achieve the EU's ambitious connectivity goals and reduce the gap with other global regions in terms of digitisation of citizens and businesses even before 6G. We note that there are differences among Member States on mobile date use, as well as availability of harmonised spectrum for public mobile networks, because of set-asides to local licenses, bluelight, or restrictions due cross-border or existing national use. Thus, the demand and urgency for new spectrum also varies among countries.

To ensure Europe keeps up with the global 5G pacesetters and future 6G competitors, European policymakers must provide mobile operators with the means to enable both consistent 5G user speeds at the edges of their networks and sufficient capacity to support 5G and 6G in densely populated areas in an economical and ecological sustainable manner. We note that 6G will be built on top of 5G, and

that Europe has already today a large investment gap in telecom networks and services. A WIK-Consults study commissioned by the European Commission concluded that the investment gap to reach 2030 targets is around €174 billion and is likely to exceed €200 billion depending on the options considered[1]. At the same time, significant cellular data increase is estimated, while mobile operators' revenues are estimated to remain flat in Europe. Thus, it is essential that also European spectrum policy is predictable and supports investments.

Despite refarming, reasonable densification and shared approaches (e.g. DSS), **the ambitious Digital Decade targets and support for expected cellular traffic increase will very likely not be met unless a clear roadmap of increased spectrum capacity for cellular networks is tied into European digital plans**, and sufficient amount of spectrum that is suitable also for outdoor and macro deployments is made available in due time and at fair price consistently with market needs.

Based on this, new spectrum is expected to be needed for the evolution of 5G at least in some member states, but will need to be considered and defined for 6G as well.

b) *Refarming*

ETNO reminds that refarming existing spectrum bands with new technologies is based on operators' needs and strategies. Operators' objective is to use spectrum as efficiently as possible, therefore, existing bands will be refarmed as early as possible based on market considerations such as traffic in different technology generations. Dynamic Spectrum Sharing (DSS) allows smooth transition between 4G and 5G technologies in same bands, and we expect DSS to be available also with 6G.

Refarming provides an increase in spectral efficiency, but is not sufficient to meet the expected increase in traffic demand. It should be considered as a complement to new spectrum.

c) *Local and vertical demands*

We note that many countries already have set-aside spectrum for local/vertical use in key harmonised mobile bands, and many countries have enabled/considered local licenses in mmW bands. Also, CEPT is studying 3.8-4.2 GHz under the EC mandate for local mobile networks. ETNO is of the view that there is no need for additional dedicated spectrum for local networks or verticals to enable their use of 6G. Furthermore, ETNO proposes that vertical spectrum use should be monitored to ensure its efficient use.

ETNO appreciates that RSPG recognises the availability of other approaches to serve vertical needs and elaborates them in the annex. There are different vertical users, and demands can be served efficiently within mobile networks. These approaches can also ensure separate resources. Many vertical use cases also benefit from having the possibility to access resources in the whole network

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[1] EC study, investment and funding needs for the Digital Decade connectivity targets, July 13, 2023, https://digital-strategy.ec.europa.eu/en/library/investment-and-funding-needs-digital-decade-connectivity-targets

(different bands) and sometimes also have a need to get access outside private network without separate roaming agreements. The protection against security threats is important also for local/vertical use cases, and we note that mobile operators have long-term experience on this.

d) Agenda item 10 in WRC-23

ETNO noted that the RSPG Opinion on WRC-23 was not actively supporting an IMT agenda item for WRC-27. However, it should be recognised that an agenda item for studying the spectrum gathers all the stakeholders together to consider the sharing opportunities and to understand the future possibilities. Thus, ETNO believes that the opportunity for new IMT spectrum should be studied for WRC-27, e.g. within range 7-15 GHz.

e) Non-terrestrial networks' (NTN) role in 6G

With regard to the perspective of Non-Terrestrial-Networks (NTN), ETNO would like to emphasise that, contrary to other regions, the European countries already have a very good terrestrial mobile broadband coverage of high quality. Thus, within EU territory the demand for a complementary NTN coverage might be limited.

With regard to satellite services, ETNO 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 to provide "direct to device" satellite services in IMT bands (not allocated to Satellite Service) where exclusive usage rights have been granted to mobile operators. 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 innovative use case ensures the protection of terrestrial services. The usage of terrestrial bands or parts of them by satellites requires in any case an agreement with the respective MNO. National administrations are responsible for the compliance with regulatory provisions at country borders.

f) Licensing and spectrum costs

ETNO highlights importance of fair and reasonable licensing and award approaches for 6G. Licensing and the spectrum costs should be fair and equal for possible different users (e.g. MNOs, satellite, verticals, governmental, TV operators). This ensures efficient use of spectrum resources from a technical and socioeconomic perspective, fair competition (especially when different players and solutions serve same needs) and enables companies to invest in 6G infrastructure instead of spending money for spectrum usage rights.

g) EMF

Regarding EMF, ETNO believes harmonised limits should be applied throughout EU. We appreciate RSPG and BEREC work on this.

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2. Comments to the recommendations

In this section we provide some dedicated comments to the draft recommendations proposed in the draft Opinion.

Recommendation 1: ETNO would like to draw RSPG's attention on that key spectrum that is earmarked for 5G is not awarded efficiently and considering the market demand in all Member States. Full 400 MHz in 3.6 GHz band is not available in all Member States - some countries have set-aside spectrum for local use without providing clear justification on demand (e.g. Germany and Sweden), and some countries have restrictions due cross-border or existing use. In the 700 MHz band, some countries have reserved one third of the spectrum for possible future PPDR or governmental use. On 26 GHz band, we recognise the slow take-up and agree on the reasons provided in the Draft Opinion.

Recommendation 2: ETNO appreciates that RSPG recognises the efforts MNOs have taken with the DSS and we also expect DSS to be available for 6G.

We note that the leasing obligation models some Member States have introduced e.g. in the 3.6 GHz band are a better approach than a blunt spectrum set-aside for local licenses in key harmonised bands. However, we prefer voluntary spectrum sharing approaches based on commercial agreements.

We acknowledge that spectrum sharing will likely play a more important role on ensuring sufficient spectrum availability for mobile and the other services, but we note that without certainty for sufficient spectrum access at each time, it is not possible to ensure the high-quality mobile service expected by customers and society. Thus, we rather prefer static sharing approaches (e.g. geographical separation) rather than very dynamic. In addition, it is important to note that spectrum sharing approaches should not be used to prolong the lifetime of legacy systems and services which existence is no longer justified (e.g. demand is served by other means), and which are using spectrum inefficiently.

Recommendation 3: while ETNO recognises the need for spectrum resources for verticals, reservations in bands being harmonised for public mobile networks adversely affect the EU telecom industry by creating regulatory scarcity which leads to high spectrum prices reducing the investment capabilities of the MNOs. As noted in chapter 1, related to our views on "Local and Vertical demands" many of these use cases are and can be served efficiently within MNOs' networks.

Many of the recent 5G awards have resulted in artificially high prices, due to reserve prices benchmarked against other contexts (e.g. past auctions in the same market, or awards for similar bands in other markets) or to scarcity created by the regulator (e.g. set-asides for verticals, different lot sizes). We do not see a need for distorting the market and diminishing operators' ability to provide high quality services by making dedicated spectrum available for services/verticals that are and can be served within multipurpose broadband networks.

Furthermore, ETNO expects that the local/vertical spectrum use is monitored to ensure its efficient use. We expect that spectrum that is already reserved for verticals, can also be used with 6G. Thus,

new spectrum reservations for local/vertical use in connection with 6G availability may not be needed or justified.

Recommendation 4: The demand for mobile broadband capacity is steadily increasing independently from the used mobile technology. We expect that at least in some countries there will be a need for new spectrum already before 6G availability. The upper 6 GHz band that is considered for IMT in WRC-23 would be useable also with 5G.

It should be ensured that each Member State awards efficiently the key harmonised spectrum bands for nationwide mobile networks. All countries have not or cannot award all harmonised mobile spectrum e.g. some countries have incumbents in the band, cross-border challenges with non-EU countries, and some countries have decided to set-aside part of the spectrum for other uses (local or vertical or governmental uses).

Additionally, there are large differences in mobile data use among member states. We note that spectrum is a valuable resource to mobile operators and we deploy our spectrum efficiently: implement new features (e.g. DSS), refarm to new technologies, and densify. However, we note that densification, that was brought up in this recommendation, has also its limits, e.g. technical (inter-site interference), political (challenges to get new site places), economical (extreme densification is costly) as well as ecological (increased material and energy use).

Recommendation 5: Technology neutrality is a key EU principle and should be kept. MNO are keen to migrate to the newest and most efficient radio technology while considering the local market needs for different technology generations.

We agree that technical conditions of existing harmonised bands should be assessed in the future to allow 6G refarming. However, as we noted in the chapter 1 on "New Spectrum" refarming provides an increased spectral efficiency but is not sufficient to meet the expected increase in traffic demand. It should be considered as a complement to new spectrum.

Recommendation 6: We acknowledge the role of offloading traffic to private and personal networks using license-exempt or possibly light-licensed spectrum. However, it has to be noted that e.g. WAS/RLAN system typically provide a wireless distribution of fixed broadband access and does not provide any additional broadband capacity to what is provided by fixed broadband.

Recommendation 7: NTN will play a role for 6G but mainly as complementary to terrestrial mobile networks. We note that in Europe, the terrestrial mobile coverage is already extensive compared to other regions, and thus the relevance of NTN may be more limited. Any satellite allocations to harmonised mobile bands inherently limit the performance of the predominantly terrestrial mobile service and needs to be avoided. The usage of terrestrial bands or parts of them by satellites requires an agreement with the respective MNO. National administrations are responsible for the compliance with regulatory provisions at country borders.

Recommendation 8-9: We appreciate RSPG, EU and Member States engagement in 6G, and agree that further work on early recognition of spectrum needs is necessary. It is important to recognise the linkage of the 6G use cases and their traffic demands to the spectrum needs.

Work towards a future EU spectrum roadmap is highly appreciated, as we already mentioned in chapter 1. However, we also note that the spectrum allocations must be technology neutral. Demand for mobile broadband capacity does not depend on a specific technology but on provided and used services. The harmonisation of frequency bands should concentrate on the timing of availability and the technical conditions. The assignment dates should be decided per country according to the market demand.

ETNO (European Telecommunications Network Operators' Association) represents Europe's telecommunications network operators and is the principal policy group for European e-communications network operators. ETNO's primary purpose is to promote a positive policy environment allowing the EU telecommunications sector to deliver best quality services to consumers and businesses.

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