

Executive Summary

Attention: **Radio Spectrum Policy Group**

Notes on RSPG Draft Report RSPG24-030 FINAL of 13 November 2024

RSPG Secretariat

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EUROPEAN COMMISSION

DIRECTORATE-GENERAL FOR COMMUNICATIONS NETWORKS, CONTENT AND TECHNOLOGY
Digital Decade and Connectivity

Conclusions

The RSPG is faced with a severe dilemma in considering the next generation of mobile with its spectrum demands

The report notes that the RSPG has taken input on spectrum for 6G from a range of active stakeholders, such as statutory bodies, research projects, industry consortia, manufacturers, mobile network operators (MNOs) and satellite operators. Unfortunately this RSPG report draft has been based on the current somewhat arbitrary state of affairs in 6G research, and so is of less value than it should be. This is not the fault of the RSPG. It is more that the state of development of the 6G research initiative seems to lack the maturity of development to be well enough defined for a useful spectrum strategy to be formulated and communicated for a group of NRAs and spectrum regulators. The demand side especially seems ignored.

Essentially, the basic principles of just what 6G is, and what does it really offer and why, with the how (ie of it how delivers its services) have yet to be evaluated in terms of its market and thus its key functional specification - and hence its overall architecture, with the main (new) technical attributes in functional terms which are missing from the report. The research efforts shown so far do not seem mature enough to take a well-balanced view. Thus, it is fairly impossible for this report to be very useful, due to the current inadequate basis for recommendations. Evidently the R&D situation so far should be looking into replacing 5G, but with a research effort that is more advanced before taking any lessons from it for spectrum policy.

Moreover, the outline of 6G technology sketched here seems to be, at best, a minor advance on the current status of 5G. In consequence, the 6G development path for spectrum issues reviewed here can cover only a limited survey of the potential changes with some of their probable advances and problems. Inevitably, the result is a quite restricted view, so any suggestions here are not yet mature enough for a stable assessment of a new communications environment, that should offer an expected useful operational life of at least two decades.

As the considerations here are thus based on an evaluation of an incomplete body of work (with some six use cases, whose relevance may be challenged) the real coverage and capacity needs for the future demands of European society remain in question. Working scenarios for 6G seem to be largely taken from ITU-R, using the ITU-R IMT-2030 framework. This has been presented by a set of academic and mobile industry supplier players and thus (so far) is limited to the supply side perspectives largely. Presumably this is the origin of its

thinking, which seems to pursue a fairly narrow update of the current 5G technology, rather than to correct its mistakes, and, of course, at the same time, bring in more useful and innovative extra capabilities. Essentially the emphasis should be on progress to enhance advantageous capabilities over the current generation. Instead, it seems to try to extend 5G NR NSA capabilities in some fairly limited and expected directions, perhaps guided by the supply side's need to churn the mobile software and equipment market.

Recommendations

What should be done, given this state of affairs?

The RSPG will need to consider options for progress on defining 6G spectrum requirements that may go beyond this report. There are at least three alternative options for further action, which we should be pleased to advise further on:-

- A. To continue with the somewhat restricted view of the future of 6G and hope for concrete indications and measures on spectrum use and demand that may emerge. That would imply a series of drafts that follow progress on defining the '6G' future system – which should be straightforward, especially as the overall path seems to be a minor extension of the current 5G NSA, perhaps with a move to SA, if the markets and the economic conditions permit it.
- B. As it is too premature to take useful decisions, that might be binding for the next decade at least, it may be better to collect more information on the 6G progress and possible advances, for at least a year. Then to consider the progress made and whether a completely new set of concepts that are both financially sound, in that they meet the demand side on consumer needs and reduce the capex and opex costs for operators. Consequently the technology design should avoid deliberately choosing propagation challenges it cannot solve and also use spectrum in an innovative and economic manner that respects sustainability needs while reducing overall spectrum demand (hint – this may lie deep in signal engineering).
- C. A more constructive option may be for the RSPG to contribute and enter the 6G research area itself, specifically for two key questions:-
 - a) The main subject areas for innovative use of spectrum that should be incorporated in a next generation mobile radio systems,
 - b) What are the demand side pressures from consumers and business users that should shape new public networking systems in spectrum terms? This is a much deeper question than may at first appear, as it goes to the heart of security in the widest sense of resilience as well as performance.

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