GSA[1] Response to "Public consultation on the Draft RSPG Opinion on spectrum related aspects for next-generation wireless systems (5G)"

GSA welcomes the opportunity to provide comments on the "DRAFT RSPG Opinion on spectrum related aspects for next-generation wireless systems (5G)", part of the "STRATEGIC ROADMAP TOWARDS 5G FOR EUROPE".

GSA appreciates the effort of RSPG to enable a timely deployment of 5G in Europe, in particular a large-scale launch by 2020, by ensuring availability of the required spectrum in different frequency ranges to meet the diverse 5G requirements.

GSA has reviewed the seven items in Section 2, "The opinion of the RSPG on the strategic roadmap towards 5G for Europe", and would like to provide the following views on the six first of those items.

1) GSA agrees that the frequency range 3.4-3.8 GHz is important for 5G and that it can enable early deployment of 5G in Europe. However, this should not reduce other initiatives to secure access to additional bands suitable for 5G in bands above 6 GHz, for very high bitrates, and indeed other bands below 6 GHz. There is no single 5G band solution that will address all 5G services and applications regarding bandwidth, latency and coverage requirements.

   The 3.4-3.8 GHz range could provide both good coverage and considerably wider bandwidths than currently available for mobile broadband services; in the order of hundreds of MHz rather than tens of MHz. The propagation characteristics together with the expected performance of 5G networks will allow macro base station deployments with good coverage, and also provide opportunities for indoor coverage in many cases. In addition it will be possible to re-use existing sites to a large extent. It is expected that this band will provide a considerably enhanced user experience compared to other current IMT frequency bands, although even larger bandwidths will be required to provide the extremely high bitrates of 5G.

   From a harmonization perspective, GSA observes that several countries, such as China and Japan have expressed a strong interest in this frequency band. GSA notes that in order to reap the full benefits of this frequency band, considerable efforts will be necessary in the

[1] *The GSA (Global mobile Suppliers Association) develops strategies and plans, and contributes studies and technical analysis to international, regional and individual country policy-makers and regulators to facilitate the timely availability of spectrum for use by mobile network operators. GSA has a focus group for spectrum topics for technical and regulatory matters of radio spectrum pertaining to the successful evolution of International Mobile Telecommunication (IMT) and associated radiocommunication systems and comprises a team made up of spectrum and regulatory affairs specialists from GSA Executive Member and GSA Member companies. The GSA Spectrum Group is participating in the study work leading up the World Radiocommunication Conference meeting in 2019 (WRC-19). In addition GSA reports regularly on global spectrum harmonisation efforts and developments including auctions, assignments, allocations, and re-farming activities.*

coming years to ensure that it does not suffer from the current situation of fragmentation due to the diverse use by other services in different countries. Furthermore, it is the view of GSA that for the long term perspective serious consideration should also be given to the 3.8-4.2 GHz range, as a possible extension band to 3.4-3.8 GHz.

2) GSA agrees with RSPG on the importance of spectrum below 1 GHz in order to provide sufficient coverage for indoor and outdoor users, and for certain 5G services (mMTC and URLLC applications). Also, Pascal Lamy (Chairman of high-level group on future use of the 470-790 MHz frequency band) in his report to EC recommended a "flexibility option" involving studying scenarios that allow spectrum in the sub-700 MHz frequency band to be used for downlink-only electronic communications services in cases where there is no or declining demand for terrestrial broadcasting television services at national level. In that sense, the 700 MHz band may be useful for 5G deployment, to the extent that 4G has not already been deployed in that band by 2020. It should be noted though that in this frequency band the bandwidth is more constrained compared to higher frequency ranges, which supports the need for access to other spectrum e.g. 3.4-3.8 GHz and 3.8-4.2 GHz as discussed above, and spectrum above 6 GHz for higher bitrates.

3) GSA supports the proposal of RSPG to ensure that “technical and regulatory conditions for all bands already harmonised for mobile networks are fit for 5G use.”

   GSA supports a flexible approach enabling technical and regulatory conditions to adapt to market needs for existing bands already harmonised for Mobile and suitable for future 5G deployments. In this regard, existing least restrictive technical conditions (channelling arrangements and Block Edge Masks) should be reviewed and revised as required to facilitate 5G usage. We believe that the Mobile Operators are best positioned to determine when 5G should or could be deployed in existing harmonised frequency bands and that the timescales for such a transition should not be mandated at a European level by the European Commission.

   It is also our view however, that frequency bands already harmonised and licensed for 2G/3G/4G may not be the primary bands for deployment of 5G as their availability will vary greatly depending on country specific circumstances. Furthermore these bands are not expected to provide any considerable access to spectrum in the timeframe relevant for early 5G deployment. GSA thus again stresses the need for the timely availability of frequency ranges such as 3.4-3.8 GHz (also possibly 3.8-4.2 GHz) plus bands above 6 GHz.

4) GSA shares the view that timely prioritization of bands above 24 GHz will be valuable to the mobile industry in its effort to provide 5G equipment according to the 2020 timescale. In addition, global or regional harmonisation will be beneficial to enable economy-of-scale.

   There are many frequency bands above 24 GHz that are of potential interest for 5G, and GSA is aware of developments related to the 28 GHz band in US and Korea (with similar considerations taking place in Japan and China). With Europe aiming to achieve 5G leadership it is important to take into account these early adopters since one of the candidates for early deployment in Europe, 24.25-27.5 GHz, is directly adjacent to the 28 GHz band. For the case of Korea, the European candidate band 24.25-27.5 GHz even overlaps by 1 GHz, as Korea is planning trials for the 2018 Olympics in the 26.5-29.5 GHz range.

   It should be noted however that harmonisation does not necessarily require using the same frequency band in different regions. The industry is currently investigating the possibility for “tuning range” implementations where adjacent bands, such as 24.25-27.5 GHz and 27.5-29.5 GHz, can be supported by the same equipment. Such capabilities may enable harmonised implementation solutions even when the incumbent situation varies considerably from one country to another.

   It is important to note that one of the other candidate bands, 31.8-33.4 GHz, is not immediately adjacent to the 28 GHz band and faces 800 MHz of passive service spectrum

with stringent protection requirements in-between, thus significantly limiting opportunities for tuning-range implementations.

In addition, this means that the momentum for certain bands in other countries/regions may be used as leverage for bands suitable for Europe, to enable sufficient ecosystem and economies of scale.

Frequency bands that are adjacent to one another can be leveraged for inclusion in a single product design even if they are not all available in a single geography. Finding frequency ranges which are available in major markets, or where the available frequency bands are close enough to be supported within a single device, i.e. “globally harmonised,” is critical to achieving the economies of scale necessary to support the business case for both manufacturers and operators as well as providing affordability for consumers. Global harmonisation creates commonalities in regulatory requirements and technical specifications by reducing the cost and complexity of implementing and enabling 5G technologies.

When considering frequency bands and ranges within the European and ITU processes GSA invites European regulators and policy makers to take into consideration realistic tuning ranges and adjacencies of frequency bands.

5) GSA wishes to express some concerns if the search for 5G spectrum above 24 GHz was limited to the frequency bands listed for Agenda Item 1.13 for WRC-19 **without** taking into account developments in countries outside of Europe in some adjacent bands. While Agenda Item 1.13 contains a fairly comprehensive list of bands it should be noted that several other countries outside Europe are moving forward with the 28 GHz band which may not be suitable for Europe for the time being. Nevertheless, usage of the 28 GHz band in other regions may still provide benefits to Europe as indicated previously. This is especially relevant in relation to “tuning ranges” with a view to global implementation harmonisation via single device spanning multiple bands to provide economies of scale as explained in particular for the 24.25-27.5 GHz band.

   Regarding the three frequency bands proposed by RSPG, 24.5-27.5 GHz, 31.8-33.4 GHz and 40.5-43.5 GHz, GSA notes that whereas 31.8-33.4 GHz may be an attractive alternative for some countries based on the limited usage of incumbents, it could pose challenges to the equipment design due to the passive services below 31.8 GHz that may also limit the usability of 5G. These matters, as well as the bandwidth that can be provided by the different frequency ranges, need to be understood in greater detail before decisions are taken.

   Furthermore, the 37-43.5 GHz band presents an opportunity for global harmonisation and possible implementation via the use of a tuning range. In Europe, some parts, e.g. the 40.5-43.5 GHz band, are not extensively used by incumbents and can provide large additional 5G capacity in subsequent upgrade steps to 5G networks as more and more services will be put onto these networks.

6) It is the view of GSA that for frequency bands intended for early 5G deployment there will be a need to define Least Restrictive Technical Conditions (LTRCs) before WRC-19 in order to provide sufficient information to the mobile industry for standardisation and design of base station and terminal equipment. Ideally, such information should be available by 2018.

GSA welcomes further engagement of RSPG in making 5G spectrum available timely and offers their support.