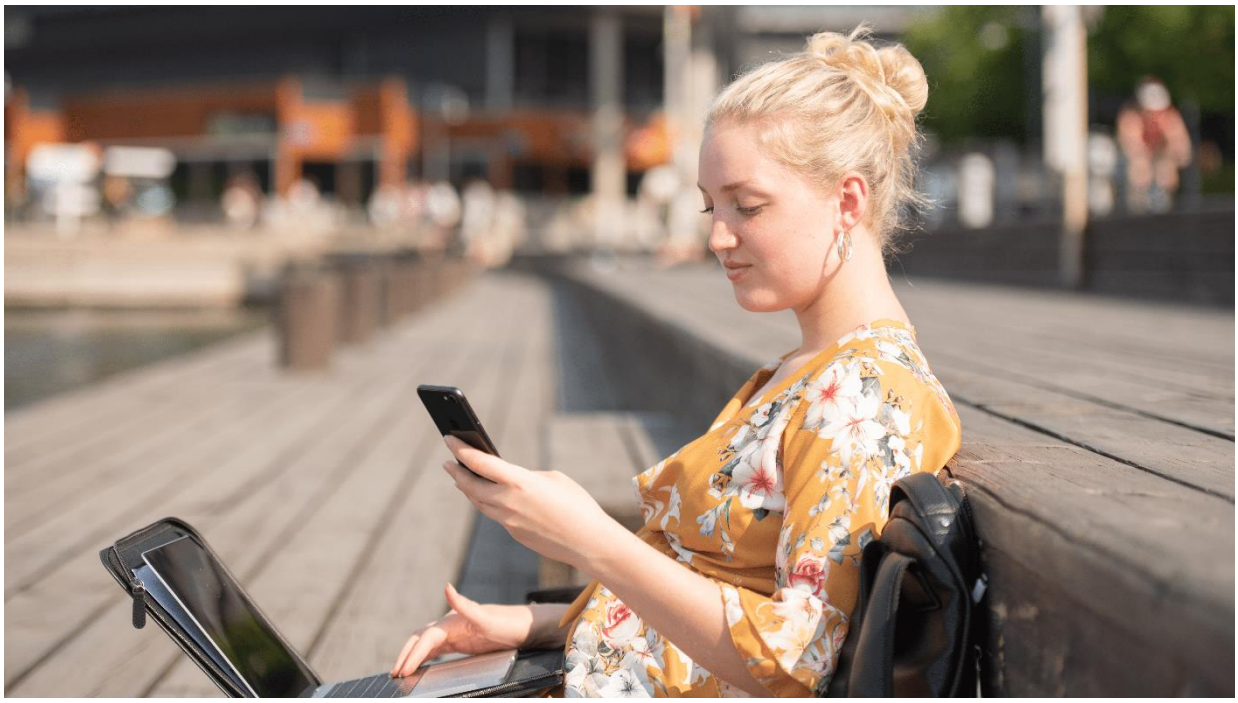
ERICSSON

Opinion on the ITU-R World Radiocommunication Conference 2023 [DRAFT]



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Ericsson applauds the efforts by the RSPG on finding a common EU position regarding critical topics for the Union and welcomes the opportunity to provide views on the different Agenda Items.

A common European position in topics that can impact EU policies or EU markets is necessary, enabling Europe to speak with a loud voice at WRC.

This response complements the responses from the relevant associations which Ericsson belongs to the RSPG consultation as well as multi-company response focused on 6GHz from European operators, associations and vendors.

Agenda item 1.2: IMT identification of 6425-7215 MHz

Ericsson appreciates that the RSPG notes that "there may be additional spectrum requirements in the "mid-band" for future development". GSMA estimates that an average of 2 GHz of spectrum is needed in the 2025-2030 timeframe[1]. This is required to meet the IMT-2020 requirements across cities and enable use cases such as Metaverse and smart sustainable cities. Outside the cities, the spectrum will help addressing fixed connectivity by Fixed Wireless Access, increase the capacity needed in busy transport routes and industry 4.0.

Europe has harmonized about 1 GHz of spectrum in the mid-band range (this includes L-band and 2.3 GHz), thus additional spectrum is needed in this range which represents "a good compromise between coverage and capacity" as indicated by RSPG. We agree with the assessment by RSPG "The band 6 425-7 125 MHz may respond to additional spectrum demand in mid-band for IMT since it has similar propagation conditions to the band 3 400 - 3 800 MHz". In fact, this is the only band which remains in Europe with the same characteristics as C-band and thus it is of critical importance.

The RSPG remarks in its consultation the consideration of "the spectrum demand for IMT (including IMT-2030) and WAS/RLAN in the medium-term perspective". We agree that Europe should secure the continuation of these complementary solutions (licensed and unlicensed) and we note that the spectrum for RLAN has just been increased by 50% (with a total of 1.5 GHz of spectrum in the mid-bands range at the moment). We also remark that the bottleneck of Wi-Fi is mostly the fixed broadband access, rather than the spectrum availability. Thus, it is important that Europe considers a strong roadmap on home broadband speed as a first step, considering both fiber and FWA. Additionally, we would like to request European Member States, RSPG and the European Commission to consider how to secure implementation the already allocated high-bands for Short Range Communication (i.e. 57-71 GHz) as this can be used by RLAN technologies to address very high capacity use cases that requires short distance, as example connecting AR/VR glasses to the mobile phone via license-exempt solutions. This is indeed how mobile networks are being planned in Europe at the moment, where a combination of low/mid/high bands are used in the most

[1] Estimating the mid-band spectrum needs in the 2025-2030 time frame

efficient way. In particular high-bands target very high capacity but more localized coverage than low/mid bands.

Ericsson is very involved on the development of 6G/IMT-2030 both inside and outside the EU and we would like to remark that while 6 GHz will contribute to address the spectrum needs for 5G within this decade, additional spectrum will be needed beyond that to address the 6G/IMT-2030 use cases (more details under AI10).

Ericsson is of the view that the allocation of 6 GHz will have large impact on the Digital Decade connectivity targets on Gigabit connectivity for everyone and 5G on all populated areas. Public wide-area networks in the upper 6 GHz will allow operators to bring the IMT-2020 performance widely within the cities in an economically feasible manner, not only bringing 5G but 5G performance. Additionally, FWA can help reaching the dreamed Gigabit society, mainly where fiber cannot reach but also where it reaches, enabling options for the European consumers and increasing competition.

A decision on IMT identification and licensing of the band at a European level will not only contribute to the EU Digital Decade goals but to the overall European economy. In 2030, 5G is expected to generate $960 billion in GDP, with the majority of benefits driven by mid-band spectrum (65 % or $610 billion). This could decrease from $960 billion to $600 billion (i.e. by 40%) if additional mid-bands are not made available[2]. Turning onto 6 GHz in particular, comparing the different alternatives for spectrum allocation (IMT/licensed or RLAN), a decision on IMT and licensed usage of the band will drive the highest economic benefit for Europe, as concluded by the GSMAi[3]. We also note that this study asses that allocating the range 5925-7125 MHz to license-exempt is never the most beneficial spectrum policy decision (compared to the allocation of the band for licensed usage or deciding on a split approach – 5925-6425 MHz for license exempt and 6425-7125 MHz for licensed).

Sharing is also a topic that the RSPG touches upon. Ericsson agrees with the RSPG statement "most satellites operating in the satellite C band over Europe are using the core uplink FSS band 5 925-6 425 MHz paired with the downlink band 3 700-4 200 MHz". In fact, Euroconsult[4] (a leading consulting company specialized on satellite) concludes that "we find little or no evidence that extended C-band is used, on a significant scale or at all, in the CEPT countries except from a small number of well-identified and protected teleports. Planned C-band is even less used, and restricted to military communications in the majority of CEPT countries that are also members of NATO". Nevertheless, Nevertheless, Ericsson shares the same opinion as the RSPG "the protection of

[2] The socio-economic benefits of mid-band 5G services

[3] Socioeconomic benefits of the 6 GHz band

[4] THE USE OF EXTENDED C-BAND, PLANNED C-BAND AND THE 7025-7075 MHZ BAND FOR SATELLITE SERVICES

satellite uplink(s) is intrinsically of international nature". A large number of studies have been performed by members of ITU (administrations and industry) with the vast majority concluding that sharing between macro-BS and FSS UL is feasible, as also hinted by RSPG "there is possible opportunity for sharing between IMT (including macro base stations) and fixed satellite service allocated to this band"

We also agree with the RSPG that "FS needs to be addressed in a medium-term perspective". Indeed, all studies performed by WP 5D conclude that coordination is feasible. Considering the different usage of FS across Europe, in terms of density as well as services provided (backhauling of public networks, public safety, broadcasting), Ericsson is of the view that a toolbox would benefit all member states to address their national circumstances. As FS provider, Ericsson would like to remark that a licensing approach of the upper 6 GHz is preferred (vs license-exempt) as a licensing regime allows coordination as well as potential mitigation of any interference that may occur. However, license-exempt spectrum does not ensure FS interference-free operation and accordingly, we expect investments to decline/disappear (even when/if theoretical studies show no interference between RLAN and FS).

The band 6 425-7 250 MHz is also of high importance for the Copernicus Imaging Microwave Radiometer (CIMR). As recognized by RSPG "the band is recognized under RR 5.458[5] without having an allocation status", and therefore risks being interfered, not only by IMT but any other service in the band. Ericsson believes that the on-going review of the allocation situation for CIMR as mentioned in the consultation, is the best way to address any current or future interference from any service.

WRC-23 will consider IMT identification of the band 6425-7025 MHz in Region 1 and 7025-7125 MHz globally. Ericsson would like to note the Agenda Item goes further than its description. IMT identification of the band 6425-7215 MHz will indeed turn into large harmonization as most countries within Region 2 and Region 3 are following the studies towards and decisions at WRC-23. Europe has the unique opportunity to drive harmonization of this band, as previously done with 3.5 GHz.

To read more about the critical importance of 6 GHz for wide-area mobile networks, please see here.

Given the above, Ericsson supports *Option 1 on the band 6 425 - 7 125 MHz - "IMT identification"* as the common European position.

[5] RR 5.458 n the band 6 425-7 075 MHz, passive microwave sensor measurements are carried out over the oceans. In the band 7 075-7 250 MHz, passive microwave sensor measurements are carried out. Administrations should bear in mind the needs of the Earth exploration-satellite (passive) and space research (passive) services in their future planning of the bands 6 425-7 075 MHz and 7 075-7 250 MHz.

We note that the RSPG mentions specific technical conditions. We would like to propose certain amendments for consideration

- Least restrictive technical conditions to protect FSS (e.g. limiting radiation towards the satellites);
- Any proportionate and viable measure to alleviate interference to the use of this band for CIMR observations, recognizing the absence of allocation status of such observations in the RR;
- Provisions at a national level to guarantee long term access of NGSO receiving earth stations in this band (e.g. based on a respective toolbox).

A decision on a Common European position of NOC, followed by a license-exempt allocation of the band 6425-7125 MHz will put at risk the fulfillment of the Gigabit connectivity goals, leaving Europe behind on the connectivity race and missing on the last available mid-band. Europe will need to accept poorer connectivity in the cities for their citizens, the risk to build smart cities and the potential to improve fixed connectivity to bridge the digital divide outside the cities.

Agenda item 1.2: IMT identification of 3300-3800 MHz

While RSPG is only proposing a Common European position to be sent to Council for the band 3 300 – 3 400 MHz, Ericsson would like to request RSPG to also consider a common position for the band 3 600 – 3 800 MHz in Region 2.

3 300 – 3 400 MHz amendment of Region 1 footnote and Region 2

We note the remark from the RSPG that "3 300-3 400 MHz is a NATO harmonised band used by military radars, including onboard ships and aircraft, and therefore relevant to the Common Security and Defence Policy (CSDP)"

While Ericsson understands concerns of usage of this band in NATO countries, there are still a number of non-NATO countries which could benefit from using the band, both in parts of Region 1 and Region 2.

Ericsson would suggest the RSPG to take this into consideration and to contemplate the possibility of finding technical conditions that would address potential concerns of interference (e.g. EU ship/aircraft is outside the regions above). Alternatively, if the European Union decides to oppose IMT identification in Region 2/amendment of Region 1 footnote as a first step, it would be advisable to consider certain flexibility on this position at WRC-23 for negotiations.

3 600 – 3 800 MHz in Region 2

This particular item does not have an impact on current EU policies, however IMT identification in Region 2 would further harmonize the 5G mid-bands primary band in the European Union (3 400 – 3 800 MHz), which would translate into a further development of the already existing ecosystem, benefiting Europe. Thus, Ericsson supports a common European position on IMT identification in the band 3 600 – 3 800 MHz in Region 2.

Agenda item 1.3: MS 3 600-3 800 MHz in Region 1

As indicated by RSPG, the band 3 600-3 800 MHz is already allocated on a primary basis in Europe. We agree with RSPG that "an upgrade would facilicate negotiations at the EU borders with non-EU countries". Ericsson also shares the RSPG view in terms of technical conditions, "resulting provisions in the RR must allow EU Member States to continue their current harmonised use in this frequency band in accordance to the Commission Implementing Decision (EU) 2019/235"

Ericsson supports the proposal by RSPG to Council to update the allocation of the 3 600-3 800 MHz frequency band to a primary mobile allocation. We would also propose to add the following as part of the conditions, "provisions in the RR should allow continuation of the Commission Implementing Decision (EU) 2019/235", in alignment with the RSPG opinion.

Agenda item 1.5: UHF

In 2015, RSPG was already forward looking in their long-term strategy for the UHF band, recognizing both "the importance of the DTT platform and the need to provide certainty for investments in broadcasting infrastructure, i.e. 2030" and "flexibility to use the 470-694 MHz band for Wireless Broad Band (WBB) downlink, provided that such use is compatible with the broadcasting needs".

Decision (EU) 2017/899 of the European Parliament and Council of 17 May 2017 on the use of the 470-790 MHz frequency band in the Union states that "Member States shall ensure availability at least until 2030 of the 470-694 MHz ('sub-700 MHz') frequency band for the terrestrial provision of broadcasting services, including free television, and for use by wireless audio PMSE on the basis of national needs".

At the same time, people's behavior is changing differently across Europe, while in some countries a very large amount of population benefit from linear TV, citizens of other EU countries prefer on-demand services, with very low usage of digital TV and accordingly a revision of the usage of this spectrum earlier than 2030.

An efficient use of the spectrum 470 - 694 MHz is required in Europe. While some countries will remain using this spectrum for DTT, other countries without this need, could allocate this range to help bridge the digital divide which is now at risk of increasing as most of the focus is put where people live, move and work. The digital decade goal of 5G everywhere requires additional low band spectrum to add capacity to the existing 5G pioneer band 700 MHz to bring as similar 5G performance to rural areas as feasible. Additionally, this band will also add capacity for deep indoors coverage in the cities. NOC will not enable efficient use of this spectrum to maximize the benefits to European citizens and businesses.

A common European position in support of primary allocation to Mobile in the band 470-694 MHz would allow flexibility for Europe, and the Union will later be

able to study and decide different band plans for compatibility with DTT, from which year mobile could be allowed, etc.

Ericsson seconds a common European position to support primary allocation to Mobile in the band 470-694 MHz to give the opportunity to Europe to study a flexible approach that can benefit all EU Members, depending on national needs. NOC option will not allow this.

Agenda item 10: AI towards WRC-27

Every 10 years approximately, we see a technological evolution: IMT-Advanced in 2010, later IMT-2020 (5G) and now coming IMT-2030 (6G). While it may feel that the time is too early in Europe as operators are rolling out initial 5G networks and Europe is studying additional spectrum within the Digital Decade, we need to recognize that spectrum discussions and harmonization is a lengthy process.

It is now the time to shape 6G. Accordingly, there are multiple projects across the world with the new generation of mobile technologies on focus, as example Hexa-X is one of the main projects defining what the future technology be, being this founded by the European Union's Horizon 2020 research and innovation program.

Europe is a large and powerful economy, in particular when all EU Member States speak with a single voice. Europe has historically harmonized spectrum outside their boundaries and has also used the ITU as one of the tools. Ericsson believes that while ITU is a difficult and long process, it brings the benefits of economies of scale and global harmonization of spectrum allocations and technical conditions, benefiting citizens, industries and enterprises. Thus, it would be highly beneficial for Europe to support an Agenda Item for IMT identification at WRC-27 which would allow Europe to take leadership on spectrum for 6G at a global scale.

6G use cases demand capacity. And this requires large spectrum bandwidth which typically is easier to find the higher the frequency is. On the other hand, the higher the frequency, the lower the coverage will be. As a result, similar to previous generations, different spectrum ranges become necessary, including existing spectrum (i.e. spectrum available today and to be made available up to 2030, such as 6 GHz) and additional spectrum. Ericsson envisions that for 6G, additional spectrum in the essential centimetric range 7-15 GHz is needed and will be complemented by the sub-THz range (above 92 GHz) for niche use cases, with focus on W (92-120 GHz) and D band (116-182 GHz)[6].

Spectrum within the 7-15GHz will allow "on the move" applications of many 6G use cases across a wide area, as example large-scale Metaverse (AR/VR/MR initiated by 5G) and holographic use are envisioned not only indoors but

[6] The 6G vision – Why is spectrum fundamental - Ericsson

outdoors across an area and on-the-move. Additionally, the sub-THz range can uniquely offer the Terabits per second (Tbps) speeds and extremely low latencies that will be key enablers for 6G niche use cases, although with some limitations in terms of coverage and mobility.

We note that the RSPG is monitoring the development closely and may provide a view in the final Opinion. Ericsson supports a common European position on an Agenda Item for IMT identification at WRC-27 and invites RSPG to further consider spectrum within the essential centimetric range 7-15 GHz as well as the complementary W band (92-120 GHz) and D band (116-182 GHz) for 6G.