



Europe

## **GSMA Response to the 3<sup>rd</sup> RSPG Opinion on 5G**

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## **About the GSMA**

The GSMA represents the interests of mobile operators worldwide, uniting more than 750 operators with over 350 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and internet companies, as well as organisations in adjacent industry sectors. The GSMA also produces the industry-leading MWC events held annually in Barcelona, Los Angeles and Shanghai, as well as the Mobile 360 Series of regional conferences.

For more information, please visit the GSMA corporate website at [www.gsma.com](http://www.gsma.com). Follow the GSMA on Twitter: @GSMA.

## Executive Summary

GSMA members are of the view that the prospects for 5G in Europe are severely hindered by fragmentation of usage rights in the “pioneer” bands, and especially in the 3400-3800 MHz frequency range. The 3<sup>rd</sup> RSPG Opinion on 5G, together with the ongoing initiatives at CEPT, illustrate that this concern is shared by spectrum regulators across the EU. The specific issues raised by the RSPG in this consultation are relevant and require a clear policy vision from spectrum managers. The GSMA therefore welcomes this new Opinion, and notes two concerns where additional RSPG guidance could reduce uncertainty and increase investor confidence.

### **3.4-3.8 GHz defragmentation:**

- In general, Regulators have not taken advantage of awards of vacant frequencies in 3400-3800 MHz to remove fragmentation in the full band;
- New Authorisations are being awarded in vacant spectrum within the band across Europe, but not enough is being done to facilitate a swift transition in the parts of the band with legacy uses. This has created artificial scarcity and increased spectrum prices. GSMA would like to highlight the lack of sufficient coordination between NRAs and Defence Authorities to clear Defence spectrum, or at least provide a roadmap on future clearance timeframes, ahead of auctions;
- When upgrading existing licences to technology neutral ones, Regulators should aim at establishing the same rights, conditions and obligations in the whole band for all players, e.g. in terms of coverage, access, trading, etc.; and ensure that windfall gains that accrue to existing licences do not distort competition in the market for electronic communication services;
- Looking forward, GSMA encourages RSPG and its members to go beyond a broad recommendation to follow guidance on defragmentation from CEPT, setting specific national objectives and monitoring compliance.

### **Connectivity for vertical industries**

- Spectrum should be awarded through national licensing procedures open to all parties, including MNOs with a national footprint, while respecting the principle of non-discrimination as well as the one of technology and service neutrality
- There should not be any special treatment or set-asides for any players
- mobile operators should be free to enter into commercial sub-leasing agreements with industrialists who may have specific needs, such as private local 5G networks

We would like to highlight the risk of delays and underuse in the 3400-3800 MHz band if the new usage rights being created are very fragmented, not flexible enough from a service and technology perspective, or MNOs are not allowed to compete for all the frequencies available. It seems to us that some of the considerations in the second part of the opinion (on granting verticals direct access to spectrum) clashes with the concerns that are being addressed in the first (on defragmenting the 3.4-3.8 GHz band). The RSPG Opinion would benefit if this internal contradiction was solved, for example clarifying that new fragmentation should not be created in the 3400-3800 MHz band, on top of that already existing due to legacy uses.

## 1. Defragmentation of 3.4-3.8 GHz band

GSMA shares the view that voluntary trading or swap deals among licencees are the preferred solution to fragmentation. Those deals, however, face several barriers that make them unlikely in some cases, and almost impossible in others, without Government intervention that in Europe can only take place in the relevant timeframe at a national level. The

CEPT report on defragmenting the band provides a useful taxonomy of possible scenarios and valuable recommendations, but ultimately it is up to the National Governments to set defragmentation targets and act accordingly. At an EU level, GSMA encourages RSPG and the rest of the EU institutions engaged in spectrum Policy to ensure ambitious targets, monitor the process periodically reporting on progress, and serve as a forum to exchange good practices.

As a matter of principle, GSMA believes that MFCN licensing of contiguous frequencies should be fostered across the full 400 MHz in the band. Being a global 5G band, that is the objective that maximises welfare. When there are incumbent uses, market mechanisms should preferably be facilitated by Member States to trigger the transition through voluntary deals, but mandated clearance and relocation should not be discarded within the limits of the existing usage rights and the competences of the National Spectrum Authorities.

When the spectrum is awarded, particularly when there is limited supply, it is important that regulators do not package spectrum in a way that prevents the auction from allowing efficient band distributions among competing bidders and can lead to “winners and losers” and the associated and highly damaging financial phenomenon of “winner’s curse” and “loser pays”. This can have long lasting implications on market structure, competition and the capacity of the sector to make capital investments.

#### a. Uses not compatible with 5G technical conditions

##### i. Legacy non-ECS uses

Military radiolocation services occupy large fragments of the 3400-3600 MHz sub-band in a few EU countries, some of them among the most populated in the EU like Spain (2x20 MHz) and Italy (2x37 MHz). Being paired national allocations, there is a multiplier effect in their value for MFCN use, as their assignment can unlock rearrangements of fragmented MFCN licences into contiguous spectrum. GSMA believes there are clear signs that the social value of those frequencies for 5G is much higher than the opportunity cost, and there is a strong case for relocating the military radars, possibly taking advantage of the opportunity to do a technology upgrade. We urge the National Spectrum Administrations involved to engage with the relevant Defence Bodies and plan the swift release and assignment of the frequencies.

We note that the draft 3<sup>rd</sup> RSPG Opinion recommends phasing out “legacy ECS use in the band, which is not compatible with the 5G harmonised technical conditions”. We suggest RSPG to expand the scope of the recommendation to include also radiolocation services.

##### ii. Fixed links and fixed satellite services

GSMA endorses the RSPG recommendation to phase out these uses, which are not compatible with the 5G harmonised technical conditions, and suggests including in the opinion concrete possible measures.

GSMA envisions four broad lines of action, that should be adapted to national circumstances:

- Prevent the expansion of current uses by not issuing new licences and not extending existing ones, as it would go against the objective of defragmenting the band.
- Where possible, and with due respect to the rights of the existing licensees, clear the band relocating existing satellite and fixed link uses to other frequencies as needed.
- Where relocation is not advisable or possible, foster co-existence between new MFCN uses and existing legacy systems by establishing sharing frameworks following the recommendations of ECC reports.

- Create incentives for legacy users that stay in the band to voluntarily facilitate co-existence and speed up the transition. To this end, Member States could adapt to their needs different mechanisms have been tested across the world, such as:
  - o Administrative spectrum prices in which existing licensees are exposed to the opportunity cost of their spectrum use.
  - o Overlay licences that prompt existing and new users to strike mutually beneficial deals.
  - o Incentive auctions in which the Administration mediates to reduce transaction costs.

Member States should in any case ensure that incumbent users do not abuse their bargaining power, hindering 5G deployments in Europe by trying to maximize the value they extract from new MFCN licences.

#### b. Legacy Fixed Wireless Access uses compatible with 5G technical conditions

GSMA agrees with RSPG that the secondary market can work best as a defragmentation tool when the different licences and uses are compatible with 5G technical conditions. New users can buy or lease legacy usage rights and deploy new networks without delay, and customers of existing Fixed Wireless Access licences can be migrated to the new networks and offered a technology upgrade.

To facilitate efficient secondary trades, Administrations should upgrade the existing licences as needed, making them tradable and service neutral. When upgrading the licences, Member States should:

- Take the opportunity to pre-empt gridlock by establishing rules that prevent licences from blocking efficient deals in the future. For example, they could undertake to adhere to reorganisations that ensure contiguity of spectrum within the band for all players.
- Ensure that windfall gains that accrue to existing licences do not distort competition in the market for electronic communication services. Where yearly fees are established based on market value and regularly updated, a normalisation of annual fees across bands that raises the ownership costs of liberalised frequencies can be helpful in this respect, and facilitate secondary market trades.
- Ensure the same rights, conditions and obligations in the whole band for all players, e.g. in terms of coverage, access, trading, etc. This should facilitate defragmentation through secondary market deals in the future.

#### c. Fragmentation of MFCN licences

As noted by CEPT in its guidance on defragmentation of the 3400-3800 MHz band, MFCN licences are generally scattered across the band. A majority of licences are for paired blocks, and have a contiguous bandwidth of 30 MHz or lower. The 3<sup>rd</sup> RSPG Opinion on 5G addresses the issue, suggesting that Member States could consider trading as part of the national defragmentation policy, and recommending them to consider the Guidance from CEPT.

National Spectrum Regulators should not put undue barriers to efficient deals. If two operators hold contiguous paired licences of the same size but different expiry dates, and wish to swap one half of their holdings to increase the amount of contiguous frequencies, the regulator can facilitate the deal by accepting a disaggregation of the different components of the licence. Operators could then swap the frequencies but not the expiration dates. We expect many socially valuable secondary deals to require spectrum regulators to interpret the law or the

extent of the usage rights before being approved. GSMA encourages Member States to prioritise economic efficiency and welfare maximisation throughout the clearing processes.

The secondary market might fail to produce a solution to fragmentation – agreements among competitors are not simple, and gridlock is likely. It is natural for a licensee not to accept a reorganisation plan that benefits their competitors, but in which they have little or nothing to gain. Conversely, a subset of licences could reach an agreement that ensures contiguity for them but makes it more difficult for third parties. Compensations among the different parties could be negotiated, but success is not ensured. GSMA encourages Spectrum Regulators to create a framework that promotes secondary market deals and minimizes the possibility of suboptimal outcomes. Some possible strategies, that should be adapted to national circumstances, are:

- The Administration could set a desired outcome (for example, contiguity of all spectrum holdings) and let licensees agree on how to get there, mediating only if negotiations fail.
- New awards could be used to remove fragmentation. The mere fact of making new frequencies available unlocks band re-organisation options that were not available before. Additionally, and in order to facilitate voluntary rearrangements, existing licensees can be incentivised to bring their holdings into the pool of the assignment round, as the CEPT Guidance suggests.

## 2. Connectivity for vertical industries

The GSMA agrees with RSPG that Vertical industries will need 5G connectivity to transform their business. As mobile operators begin commercial deployments around the world, connecting industries will be of the utmost importance.

The connectivity that the mobile industry can provide with 5G and network slicing, in all likelihood, will be a very good commercial offer for many of the use cases that Verticals have put forward. This means that mobile operators can provide customised 5G services for verticals who can then benefit from network slicing, small cells, wider geographical coverage, as well as the larger and more diverse spectrum assets, and deployment experience, at mobile operators' disposal.

Points six and seven of the RSPG Opinion show sympathy for facilitating dedicated or shared spectrum for specific vertical 5G demands that cannot be met by mobile operators. Whilst those demands should not be pre-empted, it is important that they can be met without creating further spectrum rights fragmentation, and without breaking the principle of service neutrality.

The GSMA believes that the shape of 5G connectivity for verticals is a dynamic challenge that can be efficiently determined through voluntary negotiations in the market. The award rules in the primary market determine an initial distribution of usage rights. It is important that no one is banned from this primary award, ensuring that spectrum rights are awarded to those that at that moment expect to make better use of it. However, the initial distribution is only the starting point for subsequent negotiations by private parties. Overtime, we believe the key to success will come from competitive markets for connectivity and well-functioning secondary markets for spectrum. Even when valuations expressed in the primary award are not sufficient for a vertical or business to be granted usage rights, innovation can still develop through commercial spectrum sub-leasing agreements between primary spectrum licensees, holding the spectrum usage rights, and industrialists who may have specific needs, such as private local 5G networks. In the following paragraphs we develop this vision in more detail.

#### a. Vertical set-asides

Spectrum that is set-aside nationally for vertical industries in priority 5G bands (e.g. 3.5 GHz or 700 MHz) poses several threats to the wider success of 5G. Set-asides can limit the assignment of sufficiently large contiguous blocks to allow mobile operators to deliver the fastest 5G services. Regulators should avoid set-asides where it will mean they cannot meet the aim of making available 80-100 MHz per operator contiguously in priority mid-bands (e.g. 3.5 GHz) and around 1 GHz in millimetre waves (e.g. 26 or 28 GHz).

More widely, set-asides for restricted use cases can lead to inefficient spectrum usage. Spectrum assigned outside a conventional market-based award procedure risks being underused. Another alternative to avoid fragmenting mobile frequencies would be for Vertical industries to use unlicensed spectrum for their 5G needs. There are several vertical companies that have made use of current 5.9 GHz band and LTE technology to completely automate several warehouses<sup>1</sup>. The model is proving so successful that is currently being exported across the world as a best in class connectivity solution. Such innovative approaches are tremendously powerful as they make use of the technology and economies of scale provided by the mobile ecosystem coupled with widely available frequencies. This is one example among many where vertical innovation is driving connectivity and growth and a natural place for Verticals to start innovating.

#### b. Coexistence and synchronisation

Policy makers should consider the difficulty of coexistence between different services in the same band. The GSMA is concerned about the coexistence between density networks and issues around synchronisation in all mobile spectrum bands in the context of 5G.

Synchronisation between mobile operators will already prove to be a very big challenge, to say nothing of the monumental task of international coordination that would be required at the border between countries and their respective operators. The issue will be further compounded by mixing industrial and commercial networks, presenting further technical deployment challenges, which will result in harmful interference or limit the 5G services that can be supported. For example, all 5G networks in a band will need to be synchronised which means very high-speed public broadband networks could not co-exist with very low latency industrial networks in the same area. In a scenario where Verticals are awarded a portion of mobile frequencies, at the very least, they will need to coordinate with 5G commercial networks to mitigate interference by synchronising or wasting spectrum for guard bands and establishing large separation distances between base stations thus further reducing coverage across the geography of a market.

It should be noted that previous ECC work around has proven that such synchronisation and coordination issues are a real problem. In the work they did on Public Protection and Disaster Relief (PPDR) and Railways services using adjacent spectrum to ECS networks they concluded that technical specifications of MFCN Base Station (BS) and User Equipment (UE) do not guarantee interference free operation of concurrent networks in adjacent blocks throughout the coverage area. In the case of FDD systems, an increased UE adjacent selectivity would be required. This could also affect the base stations of vertical networks deployed with a different density to ECS in TDD bands.

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<sup>1</sup> <https://www.ocadotechnology.com/what-we-do.1.html>

For TDD bands like the C-Band, it is recognised that synchronisation or semi-synchronisation of the networks is the only alternative to fully coordinating all the base stations. Where an agreement between all operators is not possible, Member States may need to facilitate coordination between base stations (similarly to PMR planning) and should therefore be prepared to provide the relevant tools or services.

Moreover, policy makers should consider whether CEPT should be invited to investigate how coexistence of these different types of deployment of 5G and previous ECS technologies could effectively happen in order to avoid situations like the GSM-R coexistence planning. This would ensure that studies were done to demonstrate that in the event of a vertical allocation within a mobile band, it would not at best limit 5G rollout or at worst bring it to a complete halt.

The GSMA would like to stress that the complexity that will be added to an already very complex situation for 5G in mobile bands would be further exacerbated if Vertical industries were to have their own dedicated frequencies within mobile bands – to say nothing of the aforementioned issues of fragmentation, cost and inefficiency.

### c. Commercial sub-leasing and secondary market

One potential solution to the Vertical needs in terms of connectivity could be the support of a secondary market through licence incentives. One way would be the inclusion of license obligations within specific bands that would oblige the winners to provide service to dedicated local needs on a commercial basis and provided there is a reasonable offer. Such an option would maintain the certainty, consistency and predictability the industry needs while also incentivising the secondary market to find a solution.

The option above could be complemented by the addition of a leasing obligation in defined local, regional or national areas should commercial discussion fail to or decide not to use mobile to provide the connectivity. Such an addition would allow the Vertical to have access to the frequencies, in a given location and lease them for the purposes of creating its own network, while allowing market forces to determine the best use of the spectrum. This bottom up approach would be creating a more dynamic secondary market for spectrum in Europe without jeopardising the future of 5G.