

Nasjonal Kommunikasjonsmyndighet

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Eutelsat's input for the consultation on local networks in 3.8-4.2 GHz / Innspill til høring om lokale nett i 3,8-4,2 GHz - Eutelsat

Eutelsat S.A., one of the world's leading satellite operators, with 38 satellites in orbit including 18 over Norway, would like to thank the Norwegian Communications Authority (NKOM) for sharing its proposal for a regulation to facilitate local networks. Eutelsat welcomes the opportunity to present its views on NKOM's consultation on local 5G networks in the 3.8-4.2 GHz band.

Eutelsat notes that NKOM proposes to allow local 5G networks in the 3.8-4.2 GHz band under a specific licensing regime. Eutelsat understands several local licenses can be put together but cannot function as a nationwide network. Further details on the criteria for defining the boundary of local networks would be welcomed. Eutelsat appreciates that NKOM is not considering making this band available for mobile network operators, in consistency with ITU regulations and CEPT decisions. Nationwide 5G networks introduction in this band would lead to very complicated compatibility with satellite services.

Eutelsat is however concerned about the impacts of the development of Fixed Wireless Access (FWA) in the 3.8-4.2 GHz band on the Fixed Satellite Services (FSS). Whereas coexistence with licensed fixed point to point (PTP) services has long been managed in the band, sharing with FWA is more problematic. Indeed, traditional fixed services use directional antennas to serve a few fixed stations at defined locations, making coordination with satellite services easy. On the contrary, delivering local 5G services through radio links to multiple users with less directional antennas and without terminal license is more of a challenge for co-frequency coordination with FSS.

Instead of introducing local 5G networks in the 3.8-4.2 GHz band, where co-existence with other services is difficult, Eutelsat invites NKOM to consider making available the 26 GHz and/or the 2.3 GHz bands for such use. NKOM is thinking about both bands for local area networks according to the consultation and they were already mentioned in 2020 when NKOM was looking for information on local and private networks¹. At that time, the 3.8-4.2 GHz band was not even considered and Eutelsat wonders why this band is then the first to be proposed. The 26 GHz band is especially well suited for local 5G use with its short transmission distance and large continuous bandwidth.

¹ See <https://www.nkom.no/frekvenser-og-elektronisk-utstyr/frekvenser-til-mobilkommunikasjon-og-5g/frekvensressurser-til-regionale-lokale-private-nett>

The C-band (3400-4200 MHz), and especially the 3.8-4.2 GHz band in Europe, is crucial for satellite services, and any kind of interference to FSS in this band should be avoided. With its unique characteristics such as ubiquitous coverage and rain resilience, the C-band has been used for decades by satellites to provide data connectivity and video services, and satellite operators rely heavily on these frequencies. Significant investments have been made to launch and develop C-band satellite services, and many earth stations are located in Europe to deliver them globally. C-band FSS is and will continue to be used by a wide range of entities both private and public, that benefit from reliable, resilient, and secure communications services provided by satellites on land, in the air, and at sea. It can also be noted that satellites are integrated in the 5G ecosystem and they will be able to bring high throughput 5G and cloud computing services to all users, including rural and remote areas.

In view of the importance of C-band for FSS and the importance of FSS for worldwide connectivity, it is vital to protect satellite services in the 3.8-4.2 GHz band if NKOM decides to allocate that band for local 5G networks. Eutelsat would like to stress the need to ensure that the whole 3.8-4.2 GHz band continues to be available for current and future FSS operations. In the consultation, while NKOM indeed states that existing earth stations would be protected, the situation of future earth stations and future usage of existing earth stations remains less clear. Eutelsat urges NKOM to clarify that point and guarantee the future regulation on local 5G usage would enable the modification of existing earth stations and the establishment of new earth stations in the 3.8-4.2 GHz band.

FSS earth stations in the 3.8-4.2 GHz band are being used to receive signals from satellites in geostationary orbit. The long distance over which the signal must be transmitted makes it very weak compared to terrestrial signal and makes earth stations very sensitive to interference from other users in the band. As such, if local 5G stations are introduced in the 3.8-4.2 GHz band, interference mitigation measures must be put in place to ensure that satellite services are not affected. This includes among others a separation distance between base stations and earth stations, and power limits to be applied at base stations.

In the consultation, NKOM proposes a maximum EIRP of 24 dBm for low power permit, and 42 dBm for high power permit. Eutelsat would appreciate more information on the studies or other elements that led to these values. Moreover, as the low power license allows the set-up of several base stations in a 50 meters radius area, Eutelsat is seeking clarification on whether the power limit would be imposed on each base station or over the area. A maximum EIRP per low power license area would in fact be necessary to coordinate with receiving earth stations and prevent interferences, considering that 5G use cases can lead to the establishment of multiple base stations in the area.

Regarding high power licenses, allowing the establishment of outdoor base stations, they could be a threat to FSS current and future operations, and coexistence with satellite services would require strong constraints. Indeed, with their high level of emission, these stations would be similar to International Mobile Telecommunications (IMT) Advanced base stations. Studies carried out by ITU²

² See ITU-R Report S.2368 “Sharing studies between International Mobile Telecommunication-Advanced systems and geostationary satellite networks in the fixed-satellite service in the 3 400-4 200 MHz and 4 500-4 800 MHz frequency bands in the WRC study cycle leading to WRC-15”.

on co-frequency sharing between IMT base stations and FSS earth stations concluded it is possible only at a large separation distance of at least tens of kilometers. Eutelsat would suggest not to deliver high power local licenses in the 3.8-4.2 GHz band so that FSS can continue to operate in the band without interferences.

In addition, careful consideration should be given to adjacent band compatibility issues if a local 5G base station plans to be located near an earth station operating in adjacent bands within the 3.8-4.2 GHz band. Separation distance, a guard band and filters for both base station and earth station could be needed to prevent harmful interferences.

Eutelsat is of the view that the conditions and technical constraints for the introduction of 5G base stations in geographically delimited areas in the 3.8-4.2 GHz band would need to be further studied to make sure co-existence with FSS in the band is possible, and does not affect the quality of service that FSS customers enjoy. The bandwidth needs for local 5G should also be thoroughly assessed. NKOM is thinking about limiting this use in some parts of the 3.8-4.2 GHz band, and Eutelsat encourages NKOM to pursue this path if the band is actually chosen for local 5G. Since private actors can already lease spectrum in the 3.6 GHz band, the whole 3.8-4.2 GHz band might not be necessary.

Eutelsat therefore believes that the proposed timeline for the use of the 3.8-4.2 GHz band for local 5G is too tight, and that hurrying to make the band available for this type of use could be harmful to essential satellite services. If NKOM decides local 5G networks are allowed to use this band, Eutelsat would like to insist on the need for a gradual implementation to protect FSS in the C-band. Eutelsat still recommends NKOM to prefer the 26 GHz or the 2.3 GHz bands for such use.

Eutelsat would welcome further discussions to make sure current and future satellite operations in the 3.8-4.2 GHz band are protected.

If you have any questions, please contact:

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Respectfully submitted,

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