

ESOA response to OFCA, Hong Kong Consultation

Proposed Allocation of the 26 GHz and 28 GHz Bands to Mobile Service and the Associated Arrangements for Spectrum Assignment and Spectrum Utilisation Fee from the Secretary for Commerce and Economic Development (SCED) and Communications Authority (CA) of Hong Kong

22 August 2018

About ESOA

ESOA, the EMEA Satellite Operators Association, is the world's only CEO-driven satellite association and leads a coordinated and impactful response to the global challenges and opportunities the commercial satellite communications sector faces. Established as a non-profit organisation, ESOA has as its objective to serve and promote the common interests of global and regional satellite operators headquartered in Europe, the Middle East, Africa and the Commonwealth of Independent States (CIS).¹ who deliver information communication services across the globe.

General Comments

ESOA welcomes the opportunity to respond to Hong Kong OFCA's consultation on this important subject and offers the following general comments for consideration.

- 1. Role of Satellite in 5G:** Satellite is increasingly being recognised as a complementary part of the global 5G network, for example for IoT, M2M, media services, connected transport networks and many other services, not only for their reach and resilience but also considering the amount of data that will require backhauling or broadcasting to users, base stations and devices. Satellite will also ensure network extension to ensure 5G-type services benefit a maximum of citizens and are not limited to serving urban areas. This role of satellite has been recognized and elaborated by the Electronic Communications Committee of the CEPT (European Conference of Postal and Telecommunications Administrations) in its report dated 18 May 2018 entitled Satellites in 5G² which also notes the increasing role of numerous high-throughput satellites (HTS): "HTS networks are operating on a global basis and can provide broadband service to end-users with bit rates in excess of 100 Mbit/s. Satellite operators are also involved in the work of 3GPP, the international body that provides a framework in which 5G standards are being developed, specifically supporting the 2 work items³ dedicated to ensuring satellite integration into the 5G ecosystem. For more information on the role of satellite in 5G, ESOA invites OFCA to review the paper '*Satellite Communication Services: An integral part of the 5G Ecosystem*'⁴.

¹ A complete list of ESOA Members can be found at www.esoa.net

² <https://www.ecodocdb.dk/download/e1f5f839-ba17/ECCRep280.pdf>

³ 3GPP TR 38.811 v0.3.0 "Study on New Radio (NR) to support non terrestrial networks (Release 15)" and 3GPP TR 22.822 "Technical Specification Group Services and System Aspects; Study on using Satellite Access in 5G" Stage 1 (Release 16).

⁴ <https://gscoalition.org/cms-data/position-papers/GSC%205G.pdf>

2. **Importance of Global Harmonisation:** ESOA further invites OFCA to give due consideration to the following elements given the importance of taking a global harmonised approach to the allocation of radio spectrum for 5G:
- In line with WRC-15 outcomes, Europe and the CEPT have taken an unambiguous position against the use of the 27.5-29.5 GHz band for terrestrial 5G mobile systems and have instead harmonised this band for broadband satellite and ESIM applications. The European Conference on Post and Telecommunications (CEPT) has issued a 5G Roadmap that explicitly notes as an action B.3: “... ***Europe has harmonised the 27.5-29.5 GHz band for broadband satellite and is supportive of the worldwide use of this band for ESIM. This band is therefore not available for 5G.***”⁵ In addition the Radio Spectrum Policy Group (RSPG) is in the process of adopting its Opinion on WRC-19 which indicates: “*The RSPG recommends that the European Commission propose an EU position to the Council **opposing** any consideration of the 27.5 - 29.5 GHz band under Agenda item 1.13 [of WRC-19]*”⁶
 - Any decision to introduce terrestrial 5G mobile services into bands shared with satellite must allow for future satellite deployments in the band, consistent with the co-primary status of both services. This is notably the case of the 24.25-27.5 GHz band within which in Europe, the Fixed Satellite Service (FSS) has a 500 MHz allocation in the 24.75-25.25 GHz band. The most recent CEPT decision in this regard states: “*CEPT administrations need to maintain, with appropriate provisions in their authorisation for MFCN, the possibility for existing and future EESS/SRS earth stations in the 25.5-27 GHz band and FSS earth stations in the 24.25-25.25 GHz to use their respective bands **and to safeguard their future operations taking into account the Radio Regulations***”⁷
3. ESOA would respectfully make the following specific points to OFCA:
- a. The statement that the bands 27-27.5 GHz and 27.5-28.35 GHz have not been used for FSS purposes is incorrect as (i) several satellites from both ESOA members **and Hong Kong satellite operators**, already use the band or parts of the band and (ii) major teleports in Hong Kong have, for several years, operational, licensed antennas, transmitting in this band.
 - b. A growing number of satellite operators are deploying “High Throughput Satellites” (HTS) to offer more capacity and higher bandwidth to meet the connectivity demands of users, including for both fixed terminals and mobile terminals known as “ESIMs” or “Earth Station In Motion.”⁸ In general, HTS satellites will play an important role in enabling the 5G applications associated with vehicular, aero and mobile connectivity for end users and their gateways will increasingly transmit within these bands: starting from 27.5 GHz, but also in the 27-27.5 GHz band.

⁵ https://cept.org/Documents/ecc/45004/ecc-18-104-annex-17_cept-roadmap-5g

⁶ https://circabc.europa.eu/sd/a/7ab8a6bb-f59a-434f-9b66-606b5a8067ce/RSPG18-023final-Opinion_WRC19-for_public_consultation.pdf

⁷ <https://www.ecodocdb.dk/download/5e74d0b8-fbab/ECCDec1806.pdf>

⁸ ECC Decision 13(01); ECC Decision 15(04)

- c. The 24.65-25.25 GHz band is a part of the 26 GHz band and is primarily used for feeder links for the broadcasting satellite service (BSS). Given the long development cycle and 15-20 year lifecycle of satellite systems, and the fact that this band was only recently given definitive procedures for use at WRC-12, development and deployment of satellites using these bands is still ongoing and in time, the band will see increasing use, including in Hong Kong.
- d. OFCA should give due consideration to the fact that satellite is one of the main infrastructures used to deliver regionally distributed media content to Hong Kong, consistent with Hong Kong's position as a communications hub for the region. The need to continue to meet an increasing local demand for externally originated content, data and services will require the capacities offered by satellite in these bands going forward.

CONSULTATION QUESTIONS

Concerning OFCA Q1: the allocation of the 26/28 GHz bands to mobile service and the sub-band 24.25-24.45 GHz to fixed service on primary basis and the protection of radio stations of co-primary users on a first-come-first-served basis:

- a. ESOA highlights that the ITU studies that state "*preliminary study results show that subject to certain deployment constraints, IMT services are compatible with existing services in the 26 GHz band*" are neither finished, nor agreed, and are limited to studies on the interference into receiving space stations due to aggregation of emissions from multiple 5G base stations. No studies have yet been conducted on the impact of IMT on deployment of new FSS earth stations or on the effect of 5G base stations or user terminals transmitting directly into the main reflector of an FSS earth station and thus being reflected towards the satellite.
- b. Any identification by OFCA for 5G in the 26 GHz band should respect the limitations prescribed by WRC-19 and assumptions inherent in the studies used to demonstrate compatibility.
- c. ITU Studies do not, in ESOA's view, support OFCA's statement "*the ITU study results confirm the feasibility of introducing mobile service on top of the existing services in the two frequency bands*" as the satellite applications and deployment levels in the 26 GHz and 28 GHz bands are very different.
- d. The suggested first-come-first-served approach would not be compatible with the need for continuation and development of FSS. The result would lock satellite uplinks to only the current uplink locations and frequency bands and would prohibit any evolution of the FSS.
- e. There is no global trend to identify the 28 GHz band for 5G which is part of the 27.5-31 GHz globally allocated FSS band. The 27.5-28.35 GHz band is used by satellite operators and major teleports in Hong Kong who have legally transmitted in this band for many years. In Europe, the European Communications Commission (ECC) has assigned the 28 GHz band for satellite uplinks, but not for 5G. In view of the investment, growth and increasing need for high-capacity satellite services, WRC-15 decided **NOT** to consider the 28 GHz band as a candidate band for IMT (5G) under WRC-19 Agenda Item 1.13.

- f. The 27-27.5 GHz band is allocated to FSS in ITU-R Regions 2 and 3 and provides a valuable opening for GSO gateways for HTS networks in Asia. In Hong Kong, earth stations are already in operation which are licensed also for this band. Use of the 27-27.5 GHz could prove essential to ensure sufficient uplink bandwidth for GSO HTS networks, in particular for gateway links. Therefore, ESOA advises against identifying this band for 5G and any OFCA decision should not limit the ability to develop and deploy future transmitting gateway stations in the band, e.g. through 5G operating on a strictly non-protected basis, base stations which, if encountering interference, should switch to alternative frequencies where interference from FSS is not an issue (e.g. 24.25-24.65 GHz or 25.25-27 GHz).
- g. The 24.65-25.25 GHz band is foreseen for use primarily for BSS feeder links and the expected use is for a limited number of larger earth stations (teleports, pay TV providers and Broadcasters). The ability to provide uplinks from these earth stations needs to be safeguarded. To facilitate co-existence and reduce the interference area around earth stations, minimum earth station antenna sizes^o should be considered. To protect receiving space stations, 5G transmitters in this band will need to comply with ITU-prescribed restrictions and those inherent in the studies used to demonstrate compatibility between the services.

Concerning OFCA Q2: adopting an administrative assignments approach for the release of spectrum in the 26/28 GHz bands:

As previously stated, WRC-15 decided **NOT** to consider the 28 GHz band as a candidate band for IMT (5G) under WRC-19. WRC-19 will take place end of 2019 and any decision should await the ITU decision during this meeting so as to make an informed decision. ESOA would like to note that any decision should consider the appropriate safeguards to FSS current and future services.

Concerning OFCA Q3: the proposed band plan with frequency slots of 100 MHz each:

ESOA considers that any decision should be made after WRC-19 once decisions on harmonized frequencies for 5G have been made and standards are developed. In any case, due consideration should be given to use of channels which do not overlap with satellite frequency bands.

Concerning OFCA Q4: the proposal of assigning (a) 3 300 MHz to 3 700 MHz of spectrum in the 26/28 GHz bands for the provision of large scale public 5G services and (b) the remaining 400 MHz to 800 MHz of spectrum in the two frequency bands to other entities for the provision of 5G services in specified locations on a shared basis:

The 28 GHz band is unsuitable per se for 5G deployment due to the extensive investments in existing and future satellites by satellite operators and the negative impact that IMT could have on these and on future growth.

However, up to 2 150 MHz of spectrum is available in the 26 GHz band (24.25-24.65 GHz and 25.25-27 GHz) which could be suitable for large scale public 5G services without raising concerns for FSS. This is about half of the bandwidth considered in this consultation. If we additionally consider that up to another 600 MHz of spectrum (24.65-25.25 GHz) could be available under certain conditions to ensure continuing

compatibility with the FSS, then up to 2 750 MHz (or two-thirds of the bands considered in this consultation) could be made available for 5G use.

Concerning OFCA Q5: the proposed caps of (a) 800 MHz of spectrum in the 26/28 GHz bands for spectrum designated for the provision of large scale public 5E services; and (b) 400 MHz of the Shared Spectrum designated for the provision of specified location services:

ESOA has no specific view but considers that the selection of frequency bands should be within the 24.25-24.65 GHz and 25.25-27 GHz bands not shared with the FSS, or the 24.65-25.25 GHz band that are shared with the FSS under certain conditions to ensure continuing compatibility.

Concerning OFCA Q6: no view.

Concerning OFCA Q7: a preference on the assignment of spectrum in the 26 GHz or 28 GHz band:

ESOA has no particular view on how capacity within these bands is distributed between assignees as long as frequencies are selected within the bands in indicated in Questions 4. ESOA would highlight that differing approaches towards the 28 GHz band (e.g. USA, Korea) are a reflection of decisions based on unique domestic situations that have historically altered their use of this band. These national decisions should not influence OFCA or others who, we respectfully submit, should stick to the IMT-2020 candidate bands identified for study by WRC-15, which are clearly being followed in key ITU regions.

Concerning OFCA Q8: the proposed assignment method for the Shared Spectrum:

ESOA understands that “shared spectrum” in this consultation refers to the same technology operators sharing spectrum and not to sharing with other services. Should 24.65-25.25 GHz band, or portions of it be considered for such 5G use, sharing with BSS feeder links will be necessary. ESOA believes that co-existence between 5G deployment and BSS feeder links may be feasible if the appropriate measures to protect receiving space stations and to enable future deployment of earth stations are taken.

Concerning OFCA Q9: the network and service rollout obligations proposed to be imposed on the use of spectrum assigned for the provision so large scale public 5G services

As long as 5G deployment respects the frequency bands and principles referred to above, we do not have any particular view on network and service rollout obligations.

Concerning OFCA Q10: the proposed performance bond for guaranteeing compliance with the proposed network and service rollout obligations for using spectrum assigned for the provision of large scale public 5G services:

ESOA considers that attention and incentives should be given to operators to demonstrate technical excellence to ensure compatibility with other services and a collaborative plan to meet the objectives.

Concerning OFCA Q11: the proposal for SUF:

With respect to this question, ESOA would refer to the consultation response submitted by the local association AVIA.