

**The Views and Comments of China Mobile Hong Kong Company Limited
("CMHK")**

to

Consultation Paper

of

**Arrangements for Assignment of the Spectrum in
The 3.3GHz and 4.9GHz Bands for the Provision of
Public Mobile Services and the Related Spectrum Utilisation Fee**

Issued on 28 August 2018

Question 1: Do you have any views on the proposed amendment to the Hong Kong Table of Frequency Allocations as regards the allocation of the 3.3 – 3.4 GHz band and the 4.83 – 4.94 GHz band for mobile service on a co-primary basis in addition to the respective existing uses?

CMHK: CMHK agrees with the allocation of 3.3 – 3.4 GHz band for mobile service on a co-primary basis but for indoor use only.

The proposed allocation of 4.83 – 4.94 GHz band only adds 100MHz bandwidth for mobile service is considered not sufficient. In WRC15, 4.4 – 4.9 GHz band had been proposed for the provision of International Mobile Telecommunication (“IMT”) services. According to the Hong Kong Table of Frequency Allocation by OFCA, 50% of frequency channels in the 4.4 – 4.94 GHz band are vacant at present while 4.94 – 4.99 GHz band is assigned for Government services. On 9-Nov-2017, the Ministry of Industry and Information Technology (“MIIT”) of the Mainland assigned 4.8 – 5.0 GHz band for 5G mobile services. CMHK opines that CA should consider and schedule a plan of relocating existing services, and free up a contiguous 200MHz spectrum in 4.8 – 5.0 GHz band for mobile and fixed service in any locations by 2020. This can supplement the 5G service black holes caused by the restriction zones imposed for 3.4 – 3.6 GHz band assignment.

Question 2: Do you have any views on assigning the spectrum in the 3.3 GHz and 4.9 GHz bands by way of auction?

CMHK: Referring to comment in above Q1, CMHK opines that CA should work out a plan to free up a contiguous 200MHz of spectrum in 4.8 – 5.0 GHz band. In consideration of the two restriction zones imposed for 3.4 – 3.6 GHz band assignment, CMHK proposes that the spectrum in 3.3 GHz and 4.9 GHz bands should be administratively assigned to the respective MNOs acquired with the 3.4 – 3.6 GHz band proportionally, in order to supplement their service black holes in the two restriction zones.

Question 3: Do you have any views on the proposal that the bandwidth of each frequency block in the 4.9 GHz band spectrum should be up to 50 MHz?

CMHK: CMHK has no objection to the proposed bandwidth of each frequency block in the 4.9 GHz band spectrum up to 50MHz, but suggests that the MNOs acquired with

the blocks should have obligation to shift the spectrum allocation in order to allow contiguous block assignment in future if more frequencies in the vicinity of 4.83 – 4.93 GHz band are made available for allocation.

On the other hand, if there is a plan that more than 100MHz spectrum in 4.9GHz band can be made available for assignment (for example, in multiple of 40MHz such as 120MHz or 160MHz), CMHK proposes that each frequency block should be set to 40MHz instead.

Question 4: Do you have any views on the proposal to divide the spectrum in the 3.3 GHz band into 10 frequency blocks, each with a bandwidth of 10MHz.

CMHK: To support Enhanced Mobile Broadband (“eMBB”) services, large bandwidth is necessary to maximize the download speed of 3.3GHz band. In case of spectrum auction, it is suggested that the available spectrum be divided into 4 frequency blocks of 20MHz each and another 2 frequency blocks of 10MHz each. This can allow the possible options of carrier bandwidths ranging from 10MHz to 100MHz for deploying 5G radio access network.

Question 5: Do you have any views on the proposed spectrum cap of 40 MHz to be imposed on any bidder in the auction for the 3.3 GHz band?

CMHK: CMHK agrees with the proposed cap of 40 MHz for the 3.3 GHz band. As 3.3 GHz band is limited for indoor use, CMHK opines that OFCA can allow successful bidders of this band to share the spectrum and jointly build an indoor system to maximize the download speed if network sharing for the joint operators is feasible in future.

Question 6: Do you have any views on limiting any bidder to acquire only one frequency block with a bandwidth of up to 50MHz of spectrum in the auction for the 4.9 GHz band?

CMHK: CMHK agrees with the proposal of limiting any bidder to acquire only one frequency block with 50 MHz (or our proposal of 40 MHz in Q3 above) in the auction for the 4.9 GHz band.

Question 7: Do you have any views on the proposed format of and timing for the auctions of the 3.3 GHz band and 4.9 GHz band?

CMHK: As per our above feedback to Q2, CMHK has a strong view that CA should consider administratively assign the 3.3 GHz and 4.9 GHz bands to the respective MNOs successfully acquired with the 3.4 – 3.6 GHz band proportionally, in order to supplement their 5G service black holes in the two restriction zones for 3.5 GHz band.

If CA still insists on assigning the bands by auction, CMHK would have the following comment:

For the 3.3 GHz band, CMHK agrees to adopt the clock auction format to decide the frequency block allocation first. The value of each frequency block may be different. Following our previous feedback to CA consultation for 3.5 GHz band assignment, CMHK suggests that the bidding prices for the priority at assignment stage will be treated as a compensation to the last bidder who will likely end up with the less preferable frequency blocks. The number of bidding execution will be equal to the number of successful bidders minus one. For instance, with four successful bidders in the assignment stage, three bidding executions are expected, and the winning bidders will compensate the last bidder in each execution, as demonstrated below:

- In the 1st execution, the 1st, 2nd & 3rd bidders will compensate the 4th bidder.
- In the 2nd execution: the 1st & 2nd bidders will compensate the 3rd bidder.
- In the 3rd execution: the winning bidder will compensate opposite bidder.

For the 4.9 GHz band, CMHK agrees with the proposed format of auction.

CMHK consider the use of 3.3 GHz and 4.9 GHz bands for 5G network will serve as a supplement to the 3.4 – 3.6 GHz band, especially for the 3.5GHz restriction zone areas. CMHK proposes that the spectrum auction of 3.3 GHz and 4.9 GHz bands should be held at the same time with the auction of 3.4 – 3.6 GHz band.

Question 8: What are your views on the proposed network and service rollout obligations, as well as the imposition of the associated performance bond on successful bidders for the 3.3 GHz and the 4.9 GHz bands?

CMHK: For 4.9 GHz band, CMHK counter-propose the minimum coverage of 10% of the population within the first five years for incumbent licensee, with below standpoints:

1. It is envisaged that the 5G network at 4.9 GHz band will supplement the coverage & capacity of 5G network at 3.5 GHz band, especially for the two restriction zones for 3.5 GHz band assignment.
2. Penetration loss of 4.9GHz is higher than other currently released lower spectrum bands such as 2600MHz, 2300MHz, 1800MHz or 900MHz. It will require more base stations to provide similar coverage as existing networks. Since 5G NR is in form of massive MIMO antenna, it will require an additional pole for 5G base station installation. In consideration of limited rooftop space and complicated landlord negotiation & approval process of existing radio sites in Hong Kong, it is expected that the sourcing of suitable site locations, either existing or new sites, for 5G base station will take longer lead time.
3. Given an operator acquired both 3.5GHz and 4.9GHz spectrum and taken the installation difficulties mentioned in point 2 above, network and service rollout obligations should count on the overall coverage of 5G network operating at both 3.5GHz and 4.9GHz bands for performance bond assessment.
4. The use cases of 5G network is quite different from previous 2G/3G/4G network. It will mostly serve specific application scenarios rather than the mass market. In consideration of 3GPP standards and market trend, 5G network will likely be deployed in Non-Standalone (NSA) architecture initially, which allows faster 5G service rollout and sustains with lesser 5G NR coverage. 5G network will mainly be deployed at hot spots to offload 4G network and support specific demand of eMBB applications. 5G network will serve as capacity layer rather than coverage layer initially.

For the indoor use of 3.3 GHz band, the form factor of 5G NR indoor system is different from existing 2G/3G/4G radio base stations. Traditionally, an indoor site is composed of baseband unit, radio unit and indoor antenna system (i.e. In-building Radio System – IRS). 5G NR is an integrated unit with Massive MIMO antenna and radio part. Baseband unit can be pooled and centralized at hub sites (C-RAN). The definition of radio base station has become unclear in 5G. 5G NR indoor system is likely deployed in the form of small cells. CMHK suggests using number of 5G NR small cells as the service rollout obligation. The network and service rollout obligation for 3.3 GHz band will then be to establish at least 500 5G NR small cells for indoor hotspots within the first five years.

Question 9: Do you have any views on the proposal in relation to SUF above?

CMHK: According to Hong Kong Smart City Blueprint, HKSAR Government strives to build Hong Kong into a world class smart city through innovation and technology. The support of 5G network development in Hong Kong is included in the plan. To work this out and to encourage telecommunication investment, CMHK opines that the auction reserve price specified by SCED should be set in a way that really shows support to the industry and promotes industry growth. Reference to historical spectrum bidding will inevitably put the kick-starting auction price at a high level that will hinder investors. Hong Kong is already one of the places being globally recognized that MNOs suffer high spectrum cost. With 5G business future still unclear, setting a high auction reserve price will undoubtedly create hindrance to investors.

CMHK welcomes the additional choice to pay the SUF by annual instalments, but do not agree with the proposed increment of a pre-set fixed percentage every year for subsequent instalments after the 1st payment. The time value of money should have already been included in the bidding price of the spectrum license stated clearly with a term of 15 years. The annual instalments should only mean that the SUF can be split equally into 15 annual payments.