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

to

OFCA Consultation Paper

of

Arrangements for Assignment of the Spectrum in the 3.4 – 3.6 GHz Band for the Provision of Public Mobile Services and the Related Spectrum Utilisation Fee

Issued on 2 May 2018

Question 1: Do you have any views on assigning the spectrum in the 3.5 GHz band through an auction?

CMHK has reservation on assigning the spectrum through an auction, for the reason that the inputs of investment in operating a mobile network in Hong Kong is substantially high, while the business case of 5G network is still uncertain. It is doubtful whether there is any new comer or competing demand in Hong Kong for the radio spectrum in 3.5GHz band. If CA can consider to assign 3.5GHz spectrum to incumbent MNOs instead of auction, it may encourage 5G technology deployment for supporting Smart City development in Hong Kong.

Question 2: Do you have any views on the proposed band plan with division of the available spectrum into ten frequency blocks, each with a bandwidth of 20 MHz?

To support Enhanced Mobile Broadband (eMBB) services, large bandwidth is necessary to maximize the download speed of 3.5GHz band. As CMHK's feedback to Question 1, CMHK has reservation on auction. Though, assuming that assigning 3.5GHz spectrum by way of auction, CMHK suggest that the available spectrum to be divided into 4 frequency blocks of 40MHz each and another 4 frequency blocks of 10MHz each. This arrangement may allow more possible options of carrier bandwidths (including 10MHz, 20MHz, 30MHz, 40MHz, 50MHz, 60MHz, 70MHz, 80MHz, 90MHz, 100MHz) for deploying 5G radio access network.

Question 3: Do you have any views on the proposed spectrum cap of 100 MHz to be imposed on any bidder in the auction?

To address the competition risk arising from potential concentration of spectrum, CMHK counter-propose a spectrum cap of 80MHz to be imposed on each bidder in the auction.

Question 4: Do you have any views on the proposed format of and timing for the auction?

As the value of each frequency block may be different, e.g. extra mitigation measure may be needed for Block A1 to avoid co-channel interference to Satellite TT&C service. Under the clock auction format, all frequency blocks put to auction are generic. At the assignment stage, it is suggested that the bidding prices for the priority 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.

The expected auction time set at the end of 2019 is considered too late. Commercial 5G network equipment will be available by the end of 2018. Mobile operators in some countries have already planned to bring 5G network into commercial service in 2019, and 5G handsets are foreseen in 2H/2019. It is wise to arrange the auction of 3.5GHz band as early as possible in this year 2018, so that the successful bidders can start early preparation of 5G network deployment.

It is even better for supporting early 5G network readiness in Hong Kong if release date of 3.5GHz band can be advanced to 30-Sep-2019, i.e. 6 months earlier than the proposed release date of 1-Apr-2020. The mitigation measure for existing SMATV receiver should be commenced as soon as possible in this year, and target for completion by 30-Sep-2019.

Question 5: Do you have any views on the proposed ONA requirement?

CMHK have the view that the proposed ONA requirement is unnecessary for future 5G network deployment. 5G network is a Service Based Architecture (SBA) supporting Network Slicing and Network Function Openness. The cloud based infrastructure with Network Function Virtualization (NFV) and Software Defined Network (SDN) capability is very elastic and ease of scalability. From previous experience of 3G network deployment, the opening up of network capacity for access by other non-affiliated mobile service providers (SPs) are mainly driven by technical and marketing need. Mobile network operators are willing to open up the network capacity for other SPs if mutual benefits and business opportunity are observed, disregard of any ONA requirement imposed.

Question 6: Do you have any views on the proposed requirements as set out in paragraphs 29 to 31 above?

For the proposed restriction zones in areas of Tai Po and Stanley, CMHK have the view that mitigation measures can be adopted to reduce the size of restriction zones. For example, relocation of concerned Satellite Earth station may be an ultimate solution to eliminate the restriction zone requirement. The details can be referred to the joint operator letter sent to OFCA on 24-May-2018.

CMHK is of the view that 3.5GHz spectrum is critical for supporting 5G network coverage. Besides, Hong Kong Science Park, which is one of the selected Smart Living Labs for pilot test of Smart City innovative applications and technologies, is located inside one of the restriction zones. The unavailability of 5G base stations at 3.5GHz spectrum in Hong Kong Science Park will hinder the Smart City development as proposed by the HKSAR Government.

For the required greater protection measures for spectrum assignee of Frequency Block A1 (particularly for 3.400 – 3.405 GHz range), CMHK agree to work closely with the operator of TT&C Station in mutual cooperative manner for implementation of any necessary protection measures, if assigned with Frequency Block A1. However, the smooth coordination between mobile operators and satellite operators should be the responsibility of OFCA. This makes the selection of proposed Block A1 less attractive. It is suggested that the investment in any necessary protection measures should be subsidized from the license fee of this particular block.

As protection measures will be imposed to protect TT&C Stations from interference of 5G base stations operating in 3.5GHz band, the signal level of 3.5GHz band should be weak in the vicinity of TT&C Stations. The mobile terminals or handsets will hand over to other frequency bands due to the weak coverage of 3.5GHz band. This is a normal network arrangement in order to ensure good service quality to our customers. There is no network-based solution available now to force handover of connected mobile terminals or handsets operating in 3.5GHz band to other frequency bands.

Question 7: Do you have any views on the proposed subsidy scheme for the upgrade of existing SMATV systems, including the funding and administrative arrangements for issuing the amount of subsidies to the affected system owners/users?

The responsibilities of ensuring a smooth coordination between mobile industry and satellite industry should be undertaken by CA. To address the interference between

mobile base stations and existing satellite receivers, CMHK is of the opinion that CA should take an active role to drive the required mitigation measures for supporting 5G development in Hong Kong. CMHK have the view that the proposed subsidy scheme for the upgrade of existing SMATV systems should be administrated by a special task force in OFCA and fully funded by the license fee of the 3.5GHz band.

Question 8: Do you have any views on the adoption of a technology neutral approach in respect of the use of spectrum in the 3.5 GHz band?

CMHK, in general, agree with the technology neutral approach.

Question 9: Do you have any views on the proposed network and service rollout obligations, as well as the associated performance bond to be imposed on successful bidders?

CMHK counter-propose the minimum coverage of 10% of the population, excluding the two proposed restriction zones, within the first five years for incumbent licensee, with below standpoints:

1. Penetration loss of 3.5GHz 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 also 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.

2. 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.

Question 10: Do you have any views on the proposals in relation to SUF above?

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 opine that the auction reserve price specified by SCED should be set in a way that really shows support to the industry and promote 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 globally where MNOs suffer high spectrum cost. With 5G business future still unclear, setting a high auction reserve price will undoubtedly create hindrance to investor.

CMHK welcome 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 clearly stated with a term of 15 years. The annual instalments should only mean that the SUF can be split equally into 15 annual payments.

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