Arrangements for Assignment of the Spectrum in the 6/7 GHz Band for the Provision of Public Mobile Services and the Related Spectrum Utilisation Fee

Consultation Paper

18 July 2023

PURPOSE

This consultation paper is jointly issued by the Communications Authority ("CA") and the Secretary for Commerce and Economic Development ("SCED") to seek views and comments of the telecommunications industry and other affected persons on the proposed arrangements for assignment of a total of 400 MHz of spectrum in the frequency ranges of 6570 – 6770 MHz and 6925 – 7125 MHz ("6/7 GHz band"), and the methods for setting the related spectrum utilisation fee ("SUF").

BACKGROUND

Supply of Radio Spectrum for the Provision of Public Mobile Services

2. Radio spectrum, a scarce public resource, is essential for supporting public mobile services and other wireless applications. Timely supply of suitable radio spectrum to the industry would facilitate the continued development of mobile services, including the fifth generation ("5G") mobile services and beyond in Hong Kong. In this regard, the CA promulgated in March 2017 the work plan for making available additional radio spectrum for public mobile services to meet the increasing aspiration of service users towards 2020 and beyond ("Work

Plan")[1]. Following the promulgation of the Work Plan, the CA has allocated a total of 4630 MHz of spectrum in the 700 MHz, 3.3 GHz, 3.5 GHz, 4.9 GHz, 26 GHz and 28 GHz bands for public mobile services and innovative wireless services between 2018 and 2021. At the same time, the CA actively explores ways to make available additional spectrum, through spectrum re-farming and vacation of suitable frequency bands, including candidate bands for 5G services, for allocation to public mobile services and innovative wireless services.

World Trend in the Use of the 6425 – 7125 MHz Band

3. One of the potential sources of additional spectrum for public mobile services is the 6425 – 7125 MHz band. Being the largest remaining single block of the mid-band spectrum[2] for mobile services, it would enable the deployment of 5G networks and services with speeds and capacity vital to the future sustainable development of digital economy and mobile broadband connectivity. Since 2019, there have been discussions among economies around the world regarding the use of spectrum in the 6425 – 7125 MHz band for public mobile services. International Telecommunication Union ("ITU") will deliberate the use of the 6425 – 7025 MHz band for the International Mobile Telecommunications ("IMT") in Region 1 (Europe and Africa), as well as the global allocation of the 7025 – 7125 MHz band for IMT at the World Radiocommunication Conference to be held from 20 November to 15 December 2023 ("WRC-23"). Some regional organisations working on the preparation for WRC-23 have shown support to the identification of the 6425 – 7025 MHz band in Region 1 and the 7025 – 7125 MHz band globally for IMT. On 28 June 2023, the Ministry of Industry and Information Technology ("MIIT") announced that the 6425 – 7125 MHz band would be allocated for IMT in Mainland China with

[1] More information about the Work Plan can be found from CA's website at: https://www.coms-auth.hk/en/media_focus/press_releases/index_id_1423.html.

[2] Mid-band for mobile services generally refers to the 1 – 7.125 GHz band.

effect from 1 July 2023[3]. Besides, some other countries in Region 3 (Asia and Oceania) also have interest and intention to use the 6425 – 7025 MHz band for IMT.

4. The 3rd Generation Partnership Project ("3GPP")[4] also introduced in June 2022 the 6425 – 7125 MHz band as one of the IMT licensed bands for 5G New Radio ("NR") (i.e. band n104) to Release 17 of the 3GPP specifications. 3GPP has developed the specifications on radio frequency characteristics of this band for both network and user equipment, to provide the technical standards for the industry to develop the relevant products.

Use of the 6425 – 7125 MHz Band in Hong Kong

5. At present, the 6425 – 7125 MHz band in Hong Kong is primarily allocated for shared use by fixed satellite service ("FSS") (Earth-to-space) (i.e. satellite uplinks) and fixed service ("FS") including fixed links and outside broadcasting links[5]. In order to make available the 6/7 GHz band for mobile services, the CA has arranged to relocate the concerned users of fixed links and outside broadcasting links operating in the frequency ranges of 6570 – 6770 MHz and 6910 – 7125 MHz to other frequency bands. The relocation exercise will be completed by 31 December 2024. In this regard, the CA has updated the Spectrum Release Plan ("SRP")[6] on 18 July 2023 to inform the industry of the supply of

[3] The announcement of MIIT (in Chinese only) is available at: https://www.gov.cn/lianbo/bumen/202306/content_6888759.htm.

[4] 3GPP is an industry-led international standardisation organisation which specialises in the development and implementation of the technical standards of global 3G, 4G and 5G mobile communication systems.

[5] Short range devices using ultra-wideband technology also share use the 6000 – 8500 MHz band in an uncoordinated manner. Owing to the low radiated power and low duty cycle of short range devices, they would not cause harmful interference to other legitimate services operating in the same band, including the prospective mobile services operating in the 6425 – 7125 MHz band.

[6] The SRP is available at: https://www.ofca.gov.hk/filemanager/ofca/common/Industry/broadcasting/updated_spectrum_plan2023_en.pdf.

415 MHz of spectrum in the frequency ranges of 6570 – 6770 MHz and 6910 – 7125 MHz. Because of the explanation given in paragraph 21 below, 400 MHz in the 6/7 GHz band is expected to be released to the market on 1 January 2025, at the earliest, for provision of public mobile services in Hong Kong. And, 15 MHz of spectrum in the frequency range of 6910 – 6925 MHz will be leftover as reserve.

6. Against the above background, the CA sets out in this consultation paper the proposed amendments to the Hong Kong Table of Frequency Allocations ("HKTFA") for the 6425 – 7075 MHz band[7] and arrangements for assignment of 400 MHz of spectrum in the 6/7 GHz band for the provision of public mobile services. SCED also sets out in this consultation paper his proposal for the arrangement of the SUF for the use of the frequency band concerned.

LEGAL AND REGULATORY FRAMEWORK

7. Under section 32G(1) of the Telecommunications Ordinance (Cap. 106) ("TO"), the CA has the statutory duty to promote the efficient allocation and use of the radio spectrum as a public resource of Hong Kong. Sections 32H(2) and 32I(1) of the TO empower the CA to allocate and assign radio frequencies and to designate which of them shall be subject to the payment of SUF following consultation with the telecommunications industry and other affected persons. Section 32I(2) of the TO empowers SCED to prescribe the method for determining the SUF. Before exercising the respective statutory powers conferred on them by the TO, the CA and SCED jointly conduct the present public consultation.

8. Section 4(4) of the Communications Authority Ordinance (Cap. 616) stipulates that the CA, in performing its functions, must have regard to the

[7] The 7075 – 7125 MHz band has already been allocated for both fixed and mobile services in Hong Kong.

following matters which appear to the CA to be relevant in the circumstances: (a) the fostering of an environment that supports a vibrant communications sector to enhance Hong Kong's position as a communications hub in the region; (b) the encouragement of innovation and investment in the communications market; (c) the promotion of competition and adoption of best practices in the communications market for the benefit of the industry and consumers; and (d) acting in a manner consistent with the provisions of the Hong Kong Bill of Rights Ordinance (Cap. 383).

9. The Radio Spectrum Policy Framework promulgated by the Government in April 2007 ("Spectrum Policy Framework")[8] sets out the policy objectives and the guiding principle in spectrum management which the CA should take into account in discharging its spectrum management responsibilities under the TO. By a statement issued in April 2007, the former Telecommunications Authority ("TA") (now the CA) explained that, in exercising his statutory powers under the TO, he would, in addition to all relevant considerations as required by law, give due regard to the Spectrum Policy Framework to the extent that there would be no inconsistency with the objectives and provisions of the TO[9].

10. Pursuant to the Spectrum Policy Framework, the policy inclination is that a market-based approach will be used in spectrum management wherever the CA considers that there are likely to be competing demands from providers of non-Government services, unless there are overriding public policy reasons to do otherwise.

[8] The Spectrum Policy Framework is available at: https://www.cedb.gov.hk/assets/resources/ccib/policies/spectrum.pdf.

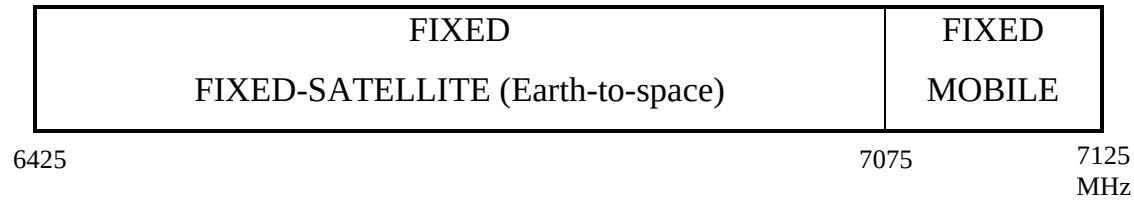
[9] The former TA Statement on the Spectrum Policy Framework is available at: https://www.coms-auth.hk/filemanager/common/policies_regulations/ca_statements/ta20070424_en.pdf.

PROPOSED AMENDMENTS TO THE HONG KONG TABLE OF FREQUENCY ALLOCATIONS FOR THE 6425 – 7075 MHz BAND

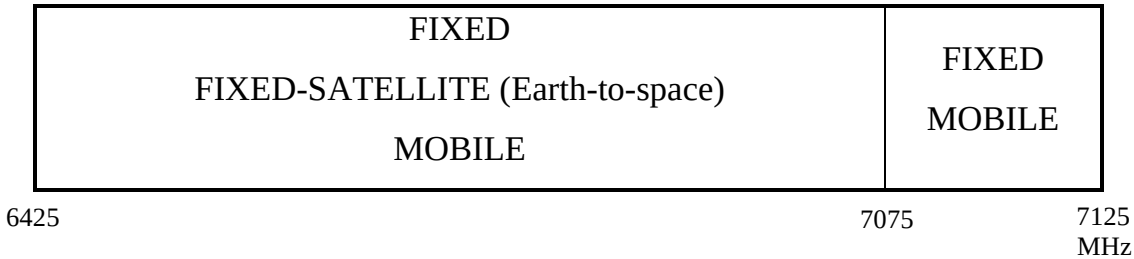
11. According to the HKTFA, the 6425 – 7075 MHz band is allocated to FS and FSS (Earth-to-space) (i.e. satellite uplinks) while the 7075 – 7125 MHz band is allocated to FS and mobile services. To enable the use of the 6/7 GHz band (which is part of the 6425 – 7125 MHz band) for the provision of mobile services, the CA proposes, pursuant to section 32H of the TO, amending the HKTFA, to allocate the 6425 – 7075 MHz band to mobile service on a co-primary basis in addition to the existing allocations to FS and FSS (Earth-to-space). The proposed additional allocation of the 6425 – 7075 MHz band to mobile service complies with the frequency allocation for Region 3 (Asia and Oceania) under the Radio Regulations of ITU. The current and proposed allocation of the 6425 – 7125 MHz band are depicted in Figure 1 below.

Figure 1: The current and proposed allocation of the 6425 – 7125 MHz band in Hong Kong

Current Frequency Allocation



Proposed Frequency Allocation



12. Under the proposed arrangement, mobile services (including 5G services or beyond), fixed links and satellite uplinks operating in the 6425 – 7075 MHz band will be primary services (i.e. on a co-primary basis) for the band. A new radio station of a co-primary service must refrain from causing harmful interference to, and will not be entitled to protection from harmful interference caused by, radio stations of other co-primary users already in existence. In gist, the radio stations of co-primary users will be protected on a first-come-first-served basis.

13. Regarding the coexistence of the services, ITU has tasked its working groups to conduct studies on the sharing and compatibility between IMT and the existing primary services allocated in the 6425 – 7125 MHz band including FS and FSS (Earth-to-space). According to the results of the relevant studies, subject to certain deployment constraints, IMT services are compatible with satellite uplinks in the 6425 – 7125 MHz band.

14. Subject to the outcome of WRC-23, appropriate conditions may be attached to the allocation of the 6425 – 7125 MHz band to align with those in the Radio Regulations of ITU. The use of the 6/7 GHz band for public mobile services in Hong Kong would need to observe the relevant resolutions or other co-existence rules to be promulgated by ITU in the future, where applicable.

Question 1:	Do you have any views on the proposed amendments to the HKTFA regarding the allocation of the 6425 – 7075 MHz band for mobile service with FS and FSS (Earth-to-space) on a co-primary basis?

PROPOSED ARRANGEMENTS FOR ASSIGNMENT OF SPECTRUM IN THE 6/7 GHz BAND

Demand for Spectrum in the 6/7 GHz Band

15. The demand for mobile data connectivity has continued to grow rapidly in recent years owing to the growing use of broadband in the worldwide telecommunications industry. Businesses and individuals across the world are increasingly reliant on high-speed and seamless internet connectivity for all sorts of activities such as education, information, commerce and entertainment as the global digitalisation trend continues, and Hong Kong is no exception. As at March 2023, local mobile subscriber penetration rate reached 288%, one of the highest in the world, and the monthly mobile data usage reached 22.7 gigabytes per capita, an increase of 35% compared with 16.8 gigabytes in March 2022. The growth of mobile data usage is expected to continue in view of the ongoing development of new innovative mobile broadband applications enabled by 5G services and beyond.

16. The spectrum in the 6/7 GHz band has been specified by the 3GPP as the frequency band that can be used for deployment of 5G services based on 5G NR technology as mentioned in paragraph 4 above. Further, spectrum in the 6/7 GHz band belongs to the mid-band spectrum which provides comparatively longer range propagation than other high-band spectrum above 7 GHz, and wider bandwidth than the low-band spectrum below 1 GHz. Therefore, the mid-band spectrum is very suitable for supporting cost effective provision of mobile broadband services to meet both coverage and capacity demands.

17. Having regard to the factors mentioned above and with reference to the keen competition for the mid-band spectrum during the previous spectrum auctions held in October and November 2019 and October 2021, **the CA considers that there are likely to be competing demands for the spectrum in the 6/7 GHz band**, when it is released to the market. According to the guiding

principle in spectrum management as set out in the Spectrum Policy Framework**, the CA proposes that a market-based approach should be adopted for assignment of the spectrum in the 6/7 GHz band.**

Assignment Approach

18. Auction is regarded as the most appropriate market-based approach for the assignment of spectrum resources as it allows the fair value of the spectrum to be determined in an open and transparent way and ensures that the successful bidders will be those who both value the spectrum the most and are expected to put it to the most efficient use during the term of assignment. Use of an auction approach is also consistent with practices adopted by both the CA and many overseas administrations for assigning spectrum for the provision of public mobile services. **The CA therefore proposes to assign the spectrum in the 6/7 GHz band by way of auction.**

19. Similar to previous spectrum auctions, the CA considers that there should only be minimal qualification requirements for registering bidders' interest and for demonstrating their capability to provide satisfactory services. The CA proposes to impose the following qualification requirements on a bidder who is interested in participating in the auction of spectrum in the 6/7 GHz band, subject to the connected bidders restrictions[10]. In short, an eligible bidder should –

(a) lodge a specified amount of deposit which may be forfeited if the bidder violates the auction rules and/or fails to take up the licence after winning the auction; and

[10] Spectrum auctions in Hong Kong are invariably subject to the connected bidders restrictions that a bidder must not be a connected bidder in relation to another bidder. A company ("Company A") is treated as a connected bidder with another company ("Company B") if –
(a) Company A holds a material interest (e.g. holding 25% or more of shares) in Company B;
(b) Company B holds a material interest in Company A; or
(c) a person holds a material interest in both Company A and Company B.

(b) demonstrate its technical and financial capability to provide services in fulfilment of the licensing obligations to the satisfaction of the CA and submit any other relevant supporting information which the CA may deem necessary.

20. Subject to fulfilment of the above qualification requirements, the CA proposes that all interested parties may apply for participation in the auction to be conducted for the assignment of the spectrum in the 6/7 GHz band.

Question 2:	Do you have any views on assigning spectrum in the 6/7 GHz band by way of auction and allowing all interested parties, subject to minimal qualification requirements and the connected bidders restrictions, to apply for participation in the auction?

Band Plan

21. According to the technical specifications adopted by the 3GPP for 5G equipment and devices, the allowable channel bandwidths for 5G NR in the 6425 – 7125 MHz are 20 MHz, 30 MHz, 40 MHz, 50 MHz, 60 MHz, 70 MHz, 80 MHz, 90 MHz and 100 MHz[11]. Taking into account that the minimum and maximum allowable channel bandwidth are 20 MHz and 100 MHz respectively, the CA proposes to assign 400 MHz of spectrum in the 6/7 GHz band out of the 415 MHz of spectrum to be made available in the frequency ranges of 6570 – 6770 MHz and 6910 – 7125 MHz in this juncture, leaving 15 MHz of spectrum in the frequency range of 6910 – 6925 MHz as residue for future consideration of use. Spectrum in the 6/7 GHz band will be tidily divided into twenty frequency blocks (i.e. Blocks A1 to A10 as the "Lower Band" and Blocks A11 to A20 as the "Upper Band"), each with a bandwidth of 20 MHz, as shown in Table 1 below.

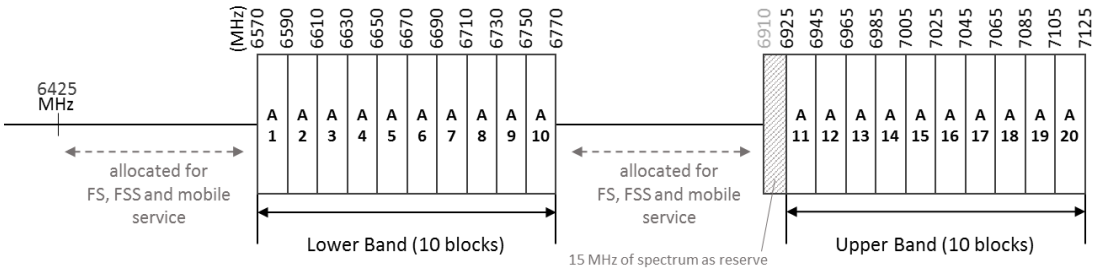
[11] The 3GPP technical specification TS 38.104 entitled "NR; Base Station (BS) radio transmission and reception" specifies the allowable channel bandwidths for the 6425 – 7125 MHz band (band n104). The technical specification is available at: https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3202.

Such a proposal enables successful bidders to attain the maximum channel bandwidth of 100 MHz by acquiring five contiguous blocks of 20 MHz, while at the same time encourages competitive bidding by affording higher flexibility for bidders to acquire other amounts of spectrum based on their own business considerations, subject to the proposed spectrum cap mentioned in paragraph 22 below. The proposed band plan for the 6/7 GHz band is summarised in Figure 2 below.

Table 1: Proposed frequency blocks and bandwidth in the 6/7 GHz band

	Frequency Block	**Frequency Range (in MHz)**	**Bandwidth**
Lower Band	A1	6570 – 6590	20 MHz
	A2	6590 – 6610	20 MHz
	A3	6610 – 6630	20 MHz
	A4	6630 – 6650	20 MHz
	A5	6650 – 6670	20 MHz
	A6	6670 – 6690	20 MHz
	A7	6690 – 6710	20 MHz
	A8	6710 – 6730	20 MHz
	A9	6730 – 6750	20 MHz
	A10	6750 – 6770	20 MHz
Upper Band	A11	6925 – 6945	20 MHz
	A12	6945 – 6965	20 MHz
	A13	6965 – 6985	20 MHz
	A14	6985 – 7005	20 MHz
	A15	7005 – 7025	20 MHz
	A16	7025 – 7045	20 MHz
	A17	7045 – 7065	20 MHz
	A18	7065 – 7085	20 MHz
	A19	7085 – 7105	20 MHz
	A20	7105 – 7125	20 MHz

Figure 2: Proposed band plan for the 6/7 GHz band



Question 3:	Do you have any views on the proposal that 400 MHz of spectrum in the 6/7 GHz band be divided into twenty frequency blocks, with a bandwidth of 20 MHz each, for assignment?

Spectrum Cap

22. While the CA intends to impose minimal constraints on spectrum acquisition in an auction, the CA is also mindful of the need to prevent an undue concentration of spectrum in the hands of any single spectrum assignee which may have the effect of restricting competition. Having considered the overall spectrum holdings of four major mobile network operators ("MNOs") in various frequency bands (excluding spectrum in the 26/28 GHz bands) as shown in Table 2 below, the CA proposes to **impose a spectrum cap for each bidder at 140 MHz** (i.e. 7 blocks each with size of 20 MHz) for the 6/7 GHz band.

Table 2: Distribution of spectrum below 7 GHz band (in MHz) by MNOs as of 31 March 2024

	700 MHz	850 MHz[1]	900 MHz[1]	1800 MHz	1.9 - 2.2 GHz	2.3 GHz[1]	2.5/ 2.6 GHz[2]	3.3 GHz	3.5 GHz	4.9 GHz	**Total**	**Share in Total**
CMHK	20		10	40	19.6	30	40	20	60	80	**319.6**	**28.7%**
HKT	20		20	40	29.6		65	30	50	40	**294.6**	**26.5%**
SmarTone	10	25	10	40	39.6		20	20	50	40	**254.6**	**22.9%**
Hutchison	20		20	30	29.6	30	15	30	40		**214.6**	**19.3%**
VNET						30					**30**	**2.7%**
Total	70	25	60	150	118.4	90	140	100	200	160	**1113.4**	**100%**

Note: 1 Auction of 10 MHz of spectrum in the 850 MHz band, 10 MHz of spectrum in the 900 band and 90 MHz in the 2.3 GHz band is expected to be held in 2024. Calculation of the above table is based on existing spectrum distribution in the 850 MHz, 900 MHz and 2.3 GHz bands.

2 Distribution of the spectrum in the 2.5/2.6 GHz band is based on re-assignment of the spectrum concerned to be effective in March 2024. In addition, it is assumed that the 10 MHz of spectrum in the 2.5/2.6 GHz held by Genius Brand due to expire in 2028 is split 50:50 between HKT and Hutchison.

23. If the above proposed spectrum cap is applied, a successful bidder of the spectrum in the 6/7 GHz band will at most acquire a total of 140 MHz or 35% of the spectrum put up for auction. This should not give rise to any competition concern as each of the major MNOs have been assigned hundreds of MHz of spectrum across various frequency bands, including (a) spectrum in the 700 MHz, 3.3 GHz, 3.5 GHz and 4.9 GHz bands which are deployed for the provision of 5G services; and (b) other spectrum being used for the provision of 3G and 4G mobiles services which can be re-farmed for the provision of 5G services. If the incumbent MNO that currently holds the largest amount of spectrum acquires 140 MHz of spectrum in the 6/7 GHz band, its share in the spectrum available for the provision of public mobile services will slightly increase from 28.7% to 30.4%[12], while the shares of spectrum holding by the other major MNOs will be in the range of 14.2% – 28.7%. In view of the above, the

[12] Calculation of spectrum holding shares by MNOs does not include spectrum assignments in the 26/28 GHz bands, as this millimetre-wave spectrum has different radio propagation characteristics and serves different purposes as compared with the low and mid-band frequencies in the provision of public mobile services.

proposed spectrum cap should not give rise to any risk of over-concentration of spectrum holding in the hands of any individual market player and will unlikely have any material impact on competition in the mobile telecommunications market.

Question 4:	Do you have any views on the proposed spectrum cap of 140 MHz to be imposed on each bidder in the auction of spectrum in the 6/7 GHz band?

Auction Format

24. With a view to facilitating successful bidders to achieve higher spectral efficiency of the acquired spectrum in the 6/7 GHz band, the CA proposes that spectrum in this band should be assigned in contiguous frequency blocks of bandwidth up to 100 MHz, given that the maximum channel bandwidth for the 6/7 GHz band is 100 MHz as mentioned in paragraph 21 above. Any assigned spectrum exceeding 100 MHz may be arranged in two separate contiguous frequency blocks as the successful bidder concerned can apply appropriate carrier aggregation techniques to provide higher speed services across multiple carriers. Since the simultaneous multiple-round ascending auction format of frequency-specific blocks, which has been used in most spectrum auctions in Hong Kong in the past, is not best suited for the assignment of contiguous frequency blocks to successful bidders in an auction, the CA proposes to **conduct the auction of spectrum by using a clock auction format**, which was adopted in the 3.3 GHz and 3.5 GHz bands auction in 2019, to ensure that contiguous frequency blocks of bandwidth up to 100 MHz in the 6/7 GHz band can be assigned to successful bidders as far as practicable.

25. The proposed clock auction would consist of two bidding stages – Quantity Stage and Assignment Stage. Under the Quantity Stage, bidders will bid for the number of frequency blocks they wish to acquire at the stipulated round

price. Bidding will take place over a number of rounds, with the round price increasing in each round in which the demand from bidders exceeds the available supply, until the total demand for frequency blocks from all bidders is equal to or less than the total supply. Following completion of the Quantity Stage, there will be the Assignment Stage at which each of the successful bidders may place a one-round sealed bid to determine their priority for assigning the frequency blocks ("Assignment Priority"). To ensure the assignment of contiguous blocks of bandwidth up to 100 MHz to each successful bidder as far as practicable, the Office of the Communications Authority ("OFCA") will work out a Provisional Assignment Plan, based on a set of predefined general principles which would be published in the Information Memorandum to be issued for this spectrum auction, for comments by all successful bidders within a specified time period. OFCA would at its sole and absolute discretion finalise the Assignment Plan taking into account the comments received. Alternatively, successful bidders may agree among themselves an Alternative Assignment Plan and make a joint submission with full justifications for consideration by OFCA. The detailed frequency assignment arrangement to be adopted at the Assignment Stage is illustrated at the **Annex** for reference.

Question 5:	Do you have any views on the proposed format of the auction for the assignment of spectrum in the 6/7 GHz band?

LICENSING ARRANGEMENTS

Licensing and Validity Period

26. The CA proposes to grant a new unified carrier licence ("UCL") to each successful bidder of spectrum in the 6/7 GHz band. According to Schedule 2 of the Telecommunications (Carrier Licences) Regulation (Cap. 106V), UCLs are issued with a period of validity of 15 years from the day on which they are issued.

The validity period of the frequency assignment will last for 15 years and be coterminous with the term of the newly issued licence. For incumbent licensees who successfully acquire spectrum in the proposed auction, they may apply to the CA for combining their existing UCLs with the new UCL to be issued.

Restriction on Frequency Swap

27. In order to facilitate competitive bidding in the auction and realise the full market value of the frequency blocks, the CA proposes that swapping of any frequency assignment in the 6/7 GHz band after OFCA has finalised the Assignment Plan as described in paragraph 25 above, and within the first five years from the date of the frequency assignment, will generally not be considered.

Technology Neutrality

28. In the assignment of spectrum for the provision of public mobile services, the CA in general adopts a technology neutral approach whereby assignees are free to use whatever technology they choose based on widely recognised standards for service provision. Unless there is any overriding reason warranting regulatory intervention (such as harmful interference to other existing services, or any electromagnetic compatibility issue with the use of spectrum by other assignees in the same and adjacent frequency bands), the CA will adhere to the technology neutral approach in assigning and licensing of spectrum in the 6/7 GHz band. Having said that, the assignees should use the spectrum in accordance with the band plan proposed in paragraph 21 above for providing 5G or other generations of mobile services under their UCLs.

Network and Service Rollout Obligations

29. In order to prevent spectrum hoarding and to ensure that the auctioned spectrum will be put into efficient use for the timely provision of

advanced telecommunications services for the benefit of the general public, the CA intends to impose network and service rollout obligations on successful bidders in a spectrum auction.

30. Taking into account the implementation work required by successful bidders to deploy the newly acquired frequency blocks in the 6/7 GHz band and having regard to the rollout requirements prescribed in general for successful bidders in other auctions, the CA proposes to require each successful bidder of spectrum in the 6/7 GHz band to roll out its network and services with use of the assigned spectrum to provide a minimum coverage of 50% of the population of Hong Kong within five years from the date of the spectrum assignment and to maintain at least the minimum coverage thereafter. In fact, the same requirement has been imposed by the CA in the assignment of spectrum in the mid frequency band in recent years.

Performance Bond for Rollout Obligations

31. To ensure compliance with the network and service rollout obligations as proposed in paragraphs 29 and 30 above, the CA proposes to require each of the successful bidders of spectrum in the 6/7 GHz band to lodge a performance bond. The amount of performance bond will be specified by the CA in the Information Memorandum to be issued for the auction of spectrum in this band.

Question 6:	Do you have any views on the proposed licensing arrangements as specified in paragraphs 26 to 31 above? Among others, do you have any views on the network and service rollout obligations proposed to be imposed on the successful bidders of spectrum in the 6/7 GHz band?

SPECTRUM UTILISATION FEE

32. Since the CA proposes the adoption of an auction as the appropriate market-based approach for the assignment of spectrum in 6/7 GHz band for non-Government use, the successful bidders should pay the SUF to be determined in the auction for use of the spectrum.

33. While the exact amount of SUF will be determined by auction, each frequency block will be subject to a reserve price which should be set at a level that represents the minimum base value of the spectrum for the purpose of kick-starting the competitive bidding process. The auction reserve price will be specified by SCED nearer the time of the auction.

34. Regarding the method of payment of SUF, to afford greater flexibility to the spectrum assignee to make financial arrangements for the payment of SUF, SCED proposes that the spectrum assignee be given a choice to pay the SUF either by –

(a) lump sum payment upfront, which is the lump sum amount determined in the auction; or

(b) annual instalments, with the first instalment equivalent to the lump sum amount referred to in (a) above divided by 15 (i.e. the number of years of assignment), and subsequent instalments to be increased every year by a pre-set percentage which aims to reflect the time value of money to the Government.

Question 7:	Do you have any views on the proposal in relation to the setting and collection of SUF as specified in paragraphs 32 to 34 above?

INVITATION OF COMMENTS

35. This consultation paper sets out preliminary views and proposals of the CA and SCED on the arrangements for assignment of the spectrum in the 6/7 GHz band and the related SUF. For the avoidance of doubt, all the information provided and views expressed in this consultation paper are for the purpose of discussion and consultation only. Nothing in this consultation paper represents or constitutes any decision made by the CA or SCED. The consultation contemplated by this consultation paper is without prejudice to the exercise of the powers by the CA and SCED under the TO and/or any subsidiary legislation thereunder.

36. The CA and SCED will carefully consider the submissions received in this consultation and are minded to make a decision on the arrangements for assignment of the spectrum in the 6/7 GHz band and the related SUF in the first half of 2024, subject to the outcome of WRC-23 scheduled to be held in November and December 2023. Taking into account the time required for making the relevant legislative amendments and completion of the relocation of existing users in the 6/7 GHz band to other frequency bands as explained in paragraph 5 above, the spectrum concerned is expected to be put to auction in the fourth quarter of 2024 and assigned in the first quarter of 2025.

37. Any person who would like to respond to this public consultation should do so on or before **15 August 2023**. **Late submissions would not be considered**. The CA and SCED may publish all or part of the views and comments received, and disclose the identity of the source in such manner as they see fit. Any part of the submissions considered commercially confidential should be clearly marked. The CA and SCED would take such markings into account in making the decision as to whether such information will be disclosed or not. Submissions should be sent to –

Office of the Communications Authority
29/F., Wu Chung House
213 Queen's Road East
Wan Chai
Hong Kong

(Attention: Principal Regulatory Affairs Manager (R22))
Fax: 2803 5112
E-mail: consult-6-7GHz@ofca.gov.hk

An electronic copy of the submission should be provided by e-mail to the e-mail address indicated above.

Commerce and Economic Development Bureau and
Office of the Communications Authority
18 July 2023

Annex

Illustration of the Frequency Assignment Arrangement to be Adopted at the Assignment Stage of the Proposed Clock Auction for the Spectrum in the 6/7 GHz Band

1. The purpose of the Assignment Stage is to determine the assignment of contiguous frequency blocks of bandwidth up to 100 MHz to each of the successful bidders in either the Lower Band or Upper Band in the 6/7 GHz band as far as practicable.

2. Each successful bidder will submit at the Assignment Stage a one-round sealed bid to determine its Assignment Priority.

3. The general principles to be adopted by OFCA to designate the Provisional Assignment Plan are as follows:

   (a) Principle 1: Order of frequency block assignment is based on the order of Assignment Stage bid prices. Bidder with the highest Assignment Stage bid price will be assigned contiguous frequency blocks from Block A20 in the Upper Band first;

   (b) Principle 2: Bidders will be assigned with contiguous frequency blocks with bandwidth up to 100 MHz as far as practicable; and

   (c) Principle 3: If assignment of more than 100 MHz in either the Upper Band or Lower Band to any successful bidder is inevitable, bidder(s) with higher Assignment Stage bid(s) will be afforded higher priority to be assigned with contiguous frequency blocks with bandwidth exceeding 100 MHz.

The aforementioned general principles are illustrated for consultative purpose only and subject to changes. The finalised set of principles will be published in the Information Memorandum to be issued for this spectrum auction.

4. Successful bidders are invited to comment on the Provisional Assignment Plan within the time period specified by OFCA. OFCA would at its sole and absolute discretion finalise the Assignment Plan taking into account the comments received. Alternatively, successful bidders may agree among themselves an Alternative Assignment Plan and make a joint submission with full justifications for consideration by OFCA.

5. Regarding the SUF payable by a successful bidder, the bidder with the highest Assignment Stage bid needs to pay the sum of its bid prices placed at the Quantity Stage and the Assignment Stage. Other bidders are required to pay their bid prices placed at the Quantity Stage only irrespective of the amount of bid prices they placed at the Assignment Stage.