Hutchison Telephone Company Limited

Response to the Consultation Paper on "Arrangements for the Frequency Spectrum in the 2.5/2.6 GHz Band upon Expiry of the Existing Assignments for the Provision of Public Mobile Services and the Related Spectrum Utilisation Fee"

Date: 10 November 2020

I. Introduction

1. Hutchison Telephone Company Limited ("**Hutchison**") makes this submission in response to the Consultation Paper entitled "Arrangements for the Frequency Spectrum in the 2.5/2.6 GHz Band upon Expiry of the Existing Assignments for the Provision of Public Mobile Services and the Related Spectrum Utilisation Fee" (the "**Consultation Paper**") jointly issued by the Communications Authority (the "**CA**") and the Secretary for Commerce and Economic Development (the "**SCED**") on 23 September 2020 .

2. Hutchison welcomes the CA's proposal to re-assign the spectrum in the 2.5/2.6 GHz band (the "**2.5/2.6 GHz Band**") for the provision of mobile services in Hong Kong. However, we are concerned about the proposed arrangements for re-assignment which ignores the adjacent frequency blocks located within the same 2.5/2.6 GHz Band and hence creates an artificial "gap" and fragmentation in the proposed band plan. Such break may have an adverse impact on spectral efficiency and overall spectrum planning in Hong Kong.

3. In this submission, we explain our concerns over the proposed arrangements for re-assignment of the 2.5/2.6 GHz Band in Part II and provide our response to the specific questions raised in the Consultation Paper in Part III.

II. Main Issues

Background

4. This Consultation Paper mainly deals with 2 x 45 MHz (or a total of 90 MHz) of spectrum in the 2.5/2.6 GHz Band (the "**Available Spectrum**") upon its expiry in March 2024. The assignment was made in March 2009 to three mobile network operators in Hong Kong ("**MNOs**")[1] with each having been assigned with 2 x 15 MHz (or 30 MHz) of spectrum.

5. The CA states that another 2 x 25 MHz (or 50 MHz) of spectrum within the same frequency band (the "**Remaining Spectrum**") is outside the scope of the present consultation. The Remaining Spectrum was auctioned in 2013 and is currently held by four MNOs in Hong Kong[2]. The existing assignments will expire in May 2028.

6. Figure 1 below shows the spectrum allocation after the auctions of the spectrum in the 2.5/2.6 GHz Band back in 2009 and 2013:

[1] The three assignees of the Available Spectrum are China Mobile Hong Kong Company Limited ("**CMHK**"), Hong Kong Telecommunications (HKT) Limited ("**HKT**") and Genius Brand Limited ("**GBL**"). GBL is a 50:50 joint venture indirectly held by HKT and Hutchison.
[2] The Remaining Spectrum is held by SmarTone Mobile Communications Limited ("**SMT**"), CMHK, HKT and GBL.

Figure 1[3]

2500-2520 MHz		2520-2530 MHz	2530-2535	2535-2540	2540-2555 MHz	2555-2570 MHz
GBL		SMT	CMHK	HKT		CMHK
15 MHz	5 MHz	10 MHz	5 MHz	5 MHz	15 MHz	15 MHz
Expiring 3/2024	**Expire 5/2028**				**Expiring 3/2024**	

7. Pursuant to the Statement issued by the former Telecommunications Authority (the "**TA**") in January 2008[4], the CA shall give a minimum notice period of three years to the incumbent assignees before expiry of the existing assignments. We are given to understand that since the Remaining Spectrum has few more years before expiry and hence the CA, based on its own work plans, intends not deal with it at the present consultation.

8. Figure 2 below shows the existing locations of the spectrum blocks[5] in the 2.5/2.6 MHz Band held by the MNOs. The proposed re-assignment of the Available Spectrum is marked in pink, whereas the Remaining Spectrum is standing in the middle:

Figure 2

2500-2515 MHz	2515-2520	2520-2530 MHz	2530-2535	2535-2540	2540-2570 MHz
	GBL	SMT	CMHK	HKT	
15 MHz	5 MHz	10 MHz	5 MHz	5 MHz	30 MHz
Expiring 3/2024	**Expire 5/2028**				**Expiring 3/2024**
Re-assignment 15 MHz	**SPECTRUM GAP**				**Re-assignment 30 MHz**

9. In addition, there is another 50 MHz of spectrum in the 2.5/2.6 GHz Band separating the uplink and downlink of the Available Spectrum and the Remaining Spectrum, which

[3] For simplicity, only uplink frequency assignments are shown in Figure 1 and Figure 2.
[4] The Statement issued by the TA is available at: http://tel_archives.ofca.gov.hk/en/tas/others/ta20080131.pdf.
[5] Figure 2 takes into account the subsequent frequency swap between HKT and CMHK.

comprises of 40 MHz of spectrum reserved for Government use and 10 MHz for guard bands (the "**Government Reserved Spectrum**").

10. For an overview of the locations of these spectrum blocks in the 2.5/2.6 GHz Band, please see the diagrams at Annex I of this paper.

Spectrum Fragmentation

11. As shown in the diagrams at Annex I, there are three "splits" in the entire 2.5/2.6 GHz Band, where the Remaining Spectrum and the Government Reserved Spectrum are standing in between the Available Spectrum. It is obvious for one to ask why the Available Spectrum and the Remaining Spectrum, with the same propagation characteristics, are to be dealt with separately.

12. Without giving any justification, the CA simply states its proposition not to deal with the Remaining Spectrum in the present consultation. No analysis of the rationale behind has been provided. Questions like these are left unanswered: What are the pros and cons for dealing with the Available Spectrum alone? Why not reviewing the Available Spectrum and Remaining Spectrum in one go for the purpose of spectral efficiency? Why not aligning the expiry dates of the Available Spectrum and the Remaining Spectrum to ease administrative burden? How to deal with and resolve the long-term issue of spectrum fragmentation within the frequency band?

13. Undoubtedly, the proposed re-assignment arrangements unnecessarily cause, and will continue to cause, hindrance to optimize spectral efficiency in the 2.5/2.6 GHz Band.

14. We understand that the regulator may simply follow its own work plans and schedules, thus opt for dealing with the Remaining Spectrum around the time near 2024, which is roughly three plus years before its expiry date. From this perspective, there is no rush to include the review of the Remaining Spectrum.

15. Nonetheless, we opine that the CA should take a holistic approach to the long-term spectrum planning of the 2.5/2.6 GHz Band, in order to achieve optimal spectral efficiency for the benefits of the telecommunications industry and the public of Hong Kong as a whole. Indeed, this is one of the CA's fundamental spectrum management obligations under the Telecommunications Ordinance[6]. Further, the Radio Spectrum Policy Framework promulgated by the Government in April 2007 (the "**Spectrum Policy Framework**") also requires the CA to take into account the public policy objectives for spectrum re-assignment of ensuring, among others, efficient spectrum utilization[7].

[6] Section 32G of the Telecommunications Ordinance requires the CA to "promote the efficient allocation and use of the radio spectrum as a public resource of Hong Kong".

[7] These public policy objectives include the need to ensure (i) customer service continuity; (ii) efficient spectrum utilization; (iii) promotion of effective competition; and (iv) encouragement of investment and promotion of innovative services.

Hutchison's Proposal

16. In view of the above, Hutchison proposes that the **existing assignment period for the Available Spectrum be extended for about four years till May 2028**, to coincide with the expiry date for the Remaining Spectrum. The alignment would create a large continuous blocks of at least 140 MHz of spectrum available for re-assignment in 2028, instead of a broken tranche of spectrum of paired blocks of 15 MHz and 30 MHz separated by an odd 25 MHz for later assignment. This alignment would resolve the problem of spectrum fragmentation.

17. As the CA has rightly pointed out in the Consultation Paper, the additional spectrum in the band would enhance MNOs' "network capacity and transmission speed or to form contiguous blocks of wider bandwidth to attain higher spectral efficiency" [8]. Undoubtedly, the alignment would put the entire band to its most efficient use.

18. In addition to spectral efficiency, our proposed alignment would give rise to other added advantages to the telecommunications industry. Firstly, the extension would give the CA more time to review the Government Reserved Spectrum and, if feasible, to vacate the spectrum for mobile use and thus potentially increase the spectrum available to a total of 190 MHz. It is in public interest to take this move creating larger contiguous blocks, bearing in mind that the 2.5/2.6 GHz Band has good radio propagation characteristics which facilitate both broad geographical coverage and wide bandwidth capacity suitable for 4G and 5G mobile deployment.

19. Secondly, the extension would also give the CA and the industry sufficient time to consider which mode of operation to be adopted properly, i.e. Frequency Division Duplex ("**FDD**") v. Time Division Duplex ("**TDD**"). Currently, the 2.5/2.6 GHz Band in Hong Kong adopts FDD, whereas the 2515 – 2675 MHz band in the Mainland, the TDD (see Annex I). Though the CA proposes to continue adopting the FDD mode of operation[9], it is desirable to have more time to observe the global development. After all, the assignment of both the Available Spectrum and the Remaining Spectrum is for a period of 15 years.

20. Thirdly, the alignment would combine two re-assignment exercises into one, and hence save administrative costs and efforts to be incurred by the Government and the industry.

21. Indeed, this is not the first time the CA has had to postpone spectrum assignment expiry dates. The latest example is the re-assignment of the 900 MHz band where the CA administratively extended the expiry date of the spectrum band so as to align the commencement date of the new assignment.

[8] Paragraph 14 of the Consultation Paper.

[9] The CA takes into account the views expressed by industry representatives at the Radio Spectrum and Technical Standards Advisory Committee meeting held with the Office of the Communications Authority in January 2020. The industry pointed out that the switch from FDD to TDD mode of the operation would involve substantial replacement of existing network equipment and engineering work.

III. Response to the Specific Questions in the Consultation Paper

Question 1:	Do you agree with the use of a market-based approach for re-assignment of the Available Spectrum pursuant to the Spectrum Policy Framework?

22. Hutchison proposes to combine the re-assignment exercises for the Available Spectrum and the Remaining Spectrum into one. Please refer to paragraphs 11 to 21 under Part II – Main Issues" for details.

23. In case the CA is minded to proceed with the auction of the Available Spectrum separately, we do not agree with the proposed market-based approach to the re-assignment of the Available Spectrum. In the past spectrum re-assignment exercises, the CA has taken into account the public policy objectives under the Spectrum Policy Framework. In particular, the need for the incumbent assignees to maintain customer service continuity. A right of first refusal (the "**RFR**") on part of the spectrum being held would be offered to the incumbent spectrum assignees for the purpose of avoiding service interruption and degradation.

24. Nonetheless, the CA does not consider continuity of customer services is an issue in the present re-assignment exercise. It makes the assumption that the gradual rollout of 5G network will absorb a portion of the 4G traffic by the time the Available Spectrum is re-assigned in 2024, and thus there should not be concerns about customer service continuity upon re-assignment of the Available Spectrum.[10]

25. However, this assumption is not accurate. Currently, the MNOs are rolling out 5G network by re-farming other generation of frequency bands or deploying the 5G spectrum bands. However, it takes time to complete the entire rollout process and migrate customers from one generation of mobile service to another. Moreover, the trend of average 4G traffic growth per customer has been over 40% annually over the past years. As such, the 4G traffic is not necessarily being offloaded onto 5G spectrum bands as the CA has assumed.

26. Of the existing 4G frequency bands, the 2.5/2.6 GHz Band is indeed the main frequency band for deployment of 4G LTE services by all the major MNOs. Existing 4G customers mainly rely on the 2.5/2.6 GHz Band for 4G LTE services. Losing all or part of it by the incumbent spectrum assignees would certainly cause service degradation and disruption. In the premises, we are of the view that the existing spectrum assignees should be offered an RFR for the Available Spectrum, just like what the CA did in the recent re-assignment of the 1.9 – 2.2 GHz band and the 1800 MHz band.

[10] Paragraph 13 of the Consultation Paper.

Question 2:	Do you have any views on the proposal that the Available Spectrum be divided into nine paired frequency blocks with a bandwidth of 2 x 5 MHz each?

27. Given that the proposed band plan is in line with the technical standards set by the industry standardization body 3rd Generation Partnership Project ("**3GPP**"), Hutchison considers the proposal to divide the Available Spectrum into nine paired frequency blocks with a bandwidth of 2 x 5 MHz each, which is the minimum allowable channel bandwidth for FDD-LTE as specified by 3GPP, reasonable.

28. Our response above is based on the assumption that the CA is to proceed with the auction of the Available Spectrum separately from that of the Remaining Spectrum.

Question 3:	Do you have any views on the proposed spectrum cap of 2 x 25 MHz to be imposed on each bidder for the re-assignment of the Available Spectrum?

29. We have no adverse comments on the proposed spectrum cap if the Available Spectrum and the Remaining Spectrum are to be re-assigned at the same time, making a larger contiguous block of spectrum available for auction.

30. However, if the CA is minded to deal with the Available Spectrum in isolation, then we would suggest the spectrum cap be set at 2 x 20 MHz. Our suggestion would avoid the scenario where two incumbent spectrum assignees would acquire all of the Available Spectrum, leaving one incumbent spectrum assignee with no or only small amount of spectrum holding in the 2.5/2.6 GHz Band and thus causing detrimental service interruption to its customers.

Question 4:	Do you have any views on re-assigning the Available Spectrum by allowing all interested parties to apply for participation in the auction?

31. Hutchison considers that GBL's participation in any spectrum auction should not bar either of its two holding companies (namely, HKT and Hutchison) from participating in the auction, provided that the "effective" amount of spectrum acquired by each of the said holding companies at the auction does not exceed the spectrum cap imposed by the CA.[11]

[11] The effective amount of spectrum acquired by HKT or Hutchison at auction is calculated by adding the amount of spectrum directly acquired by HKT or Hutchison to 50% of the spectrum acquired by GBL.

Question 5:	Do you have any views on the adoption of the SMRA auction format for the re-assignment of the Available Spectrum?

32. The adoption of the auction format depends on the arrangements for re-assignment. If the Available Spectrum is to be auctioned together with the Remaining Spectrum, it would be reasonable to adopt the Clock auction format, which manages to assign contiguous spectrum blocks to prospective spectrum assignees.

33. Yet, if the Available Spectrum is to be auctioned on its own, then the SMRA auction format should be adopted. With an artificial gap in between, the contiguous spectrum blocks would not be achieved even under the Clock auction format.

Question 6:	Do you have any views on the proposed licensing arrangements as specified in paragraphs 28 – 34 above? In particular, do you have any views on the network and service rollout obligations proposed to be imposed on the successful bidders of the Available Spectrum, and the associated performance bond or network coverage statistics as the case may be proposed for ensuring compliance?

34. Hutchison has no adverse comments on the proposed network and service rollout obligations.

35. Regarding the associated performance bond, the CA states that "if any of the nine frequency blocks of Available Spectrum is acquired by an incumbent assignee, the assignee may choose to provide network coverage figures demonstrating that its network operating with the spectrum re-assigned has already fulfilled the 90% minimum population coverage requirement, without the need to provide a performance bond for that frequency block[12] [emphasis added].

36. By "any" as underlined above, we are given to understand that if the incumbent assignee acquires ***any*** one of the nine frequency blocks (i.e. not the exact bandwidth or exact location as it previously held), it would still be eligible for a waiver of the performance bond requirements as long as it could prove fulfilment of the 90% minimum population coverage requirement. This approach is fair and reasonable. We invite the CA to clarify this point and explain if it interprets differently.

[12] Paragraph 34 of the Consultation Paper.

37. We noted from the recent consultation paper on the 4.9 GHz band[13] that a very different approach was taken in respect of the service and network rollout obligations, where the CA proposed to offer the two incumbent assignees of the 4.9 GHz band an option to provide an undertaking in lieu of a performance bond. We wonder why the same preferential treatment has not been offered to the incumbent assignees of the 2.5/2.6 GHz Band.

Question 7:	Do you have any views on the proposal in relation to the setting and collection of SUF as specified in paragraphs 35 – 36 above?

38. On the setting of the level of the spectrum utilization fee (the "**SUF**"), we opine that the reserve price should be set at a minimal level. Letting the market decide on its appropriate price level is in line with the market-based approach adopted by the CA. Reference should be made to the last 5G auctions for the spectrum in the 3.3 GHz, 3.5 GHz and 4.9 GHz bands, where the reserve prices have been set in the range of HK$2 million per MHz to HK$ 4 million per MHz.

39. Regarding the payment methods, we support the proposition that spectrum assignees should be given an option to pay the SUF either by lump-sum payment upfront or by annual instalments. In addition, we suggest that the SCED give the spectrum assignees the permission and flexibility to subsequently alter their chosen payment method upon having satisfied certain conditions set by the SCED. Given the payment is for 15 years tenor, this flexibility is of great meaning to the assignees. Such need often arises at the time when there are changes in the market environment, economic developments, and the assignees' financial situations, etc. The flexibility would help the industry better utilize its fund and facilitate investment on more innovative products and services.

40. For annual installments, the prospective assignees are required to pay the first installment (i.e. the lump-sum amount of the SUF divided by the years of assignment) and subsequent instalments, which will be increased every year by a pre-set percentage which, per SCED, aims to reflect the time value of money to the Government. The pre-set percentage is currently set at 2.5%.

41. Given the sluggish market situation in Hong Kong caused by the COVID-19 outbreak worldwide, we predict that the market interest rate will keep below 1% in the upcoming years. The current HIBOR rate (0.8% for 12 months maturity) and the U.S. 10 Years Treasury Rate (below 1%) are shown in Table 1 and Table 2 below, respectively.

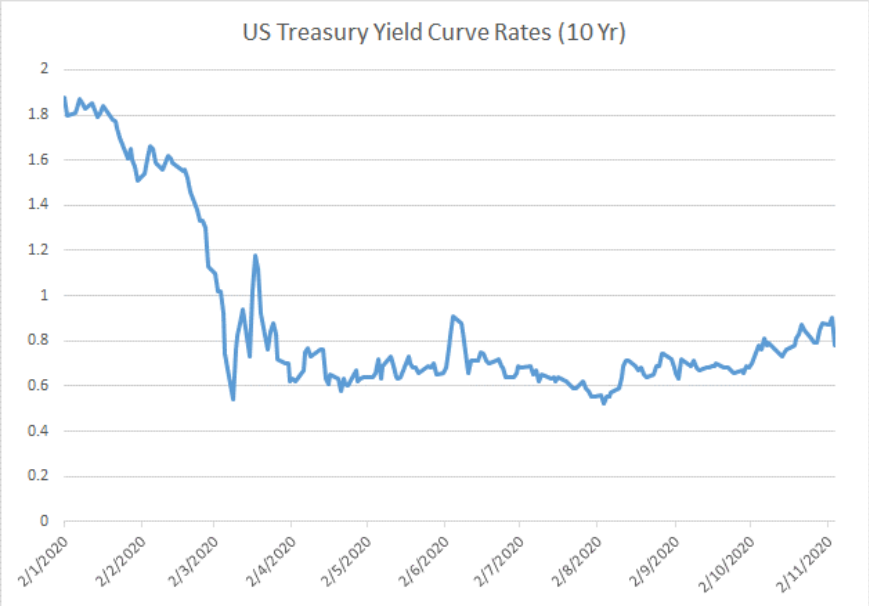
[13] The consultation paper entitled "Arrangements for Assignment of Additional Spectrum in the 4.9 GHz Band for the Provision of Public Mobile Services and the Related Spectrum Utilisation Fee" is available at: https://www.gov.hk/en/residents/government/publication/consultation/docs/2020/4.9GHz.pdf

Table 1

HKAB HKD Interest Settlement Rates Highlights (5/11/2020)	
Maturity	**HKD Interest Settlement Rates**
Overnight	0.05000
1 Week	0.11476
2 Weeks	0.15589
1 Month	0.24667
2 Months	0.35607
3 Months	0.43571
6 Months	0.62875
12 Months	0.80054

Source: The Hong Kong Association of Banks (https://www.hkab.org.hk/).

Table 2



Source: The U.S. Department of the Treasury (https://www.treasury.gov/resource-center/data-chart-center/interest-rates/pages/TextView.aspx?data=yieldYear&year=2020)

42. In view of the above, we urge the SCED to take into consideration the above market factors and reduce the interest rate applied for the SUF instalment from 2.5% to around 1%.

~ THE END ~

Annex I

Hong Kong
3GPP Band 7, FDD
Phase1: 2 x 45 MHz
(Available Spectrum)

Phase 2: 2 x 25 MHz
(Remaining Spectrum)

FDD, Uplink 2500 - 2570 MHz				FDD, Downlink 2620 - 2690 MHz		
15 MHz	25 MHz	30 MHz	50 MHz	15 MHz	25 MHz	30 MHz
Available Spectrum	Remaining Spectrum	Available Spectrum	Government Reserved Spectrum	Available Spectrum	Remaining Spectrum	Available Spectrum

Mainland China
3GPP Band 41, TDD
160 MHz

TDD, Downlink & Uplink 2515 - 2675 MHz
160 MHz
(assigned to a mobile network operator in the Mainland for 5G deployment)