Certari Consulting

SUBMISSION TO OFFICE OF THE COMMUNICATIONS AUTHORITY

Response to Second Consultation Paper:

Arrangements for the Frequency Spectrum in the 1.9 – 2.2 GHz Band upon Expiry of the Existing Frequency Assignments for 3G Mobile Services

I. INTRODUCTION AND SUMMARY

1. Certari Consulting is pleased to offer the following comments on future 3G spectrum assignment, which we consider is a matter of vital importance to all end-users of mobile services in Hong Kong.

2. In particular, it is our submission that renewal of the existing 3G spectrum assignments (i.e. "Option 1") in combination with the introduction of spectrum trading is the correct approach to achieving efficient assignment and use of previously assigned and currently utilized spectrum. Spectrum trading is a "market-based approach," as required by the 2007 Radio Spectrum Policy Framework, and avoids many of the difficult problems involved in a mandatory re-auctioning of utilized spectrum. If Hong Kong is to remain in the front rank of ICT regulators, it must implement spectrum trading without further postponement.

3. At the end of last year the Office of the Communications Authority ("**OFCA**") published a "Second Consultation Paper" discussing possible arrangements

following expiry of current assignments of spectrum in the 1.9 – 2.2 GHz band.[1] In the Second Consultation Paper, OFCA proposes three options for reassignment of spectrum in the 1.9 – 2.2 GHz band ("**3G spectrum**"). It is our submission that:

- "Option 1" is the best of the three options OFCA has proposed for comment.

- "Option 3" would seriously diminish 3G service quality for businesses and consumers in Hong Kong and must be rejected in order to avoid serious damage to Hong Kong's hitherto high-quality mobile services.

- OFCA has taken a wrong path in both the First and Second Consultation Paper by focusing on spectrum auctions in relation to utilized spectrum and should instead proceed with developing spectrum trading as a market mechanism for fine-tuning spectrum assignment within Hong Kong's highly functional and competitive market.

- The several approaches OFCA has suggested for determining the level of Spectrum Utilisation Fees ("**SUF**") are unsatisfactory – no pricing formula, however ingenious, can be as efficient as simple market forces, which should be allowed to operate by establishing a spectrum trading market.

4. As OFCA quite properly recognizes, radiofrequency is a scarce public resource and must therefore be utilized and valued appropriately. Spectrum auctions were satisfactory to accomplish the initial assignments of 3G spectrum. Spectrum auctions will have a continuing role to play in relation to vacant or vacated spectrum but spectrum trading is the appropriate method to allow market forces to fine-tune those assignments within utilized bands, either among the four existing operators or to a new entrant.

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1 Office of the Communications Authority "Arrangements for the Frequency Spectrum in the 1.9 – 2.2 GHZ band upon Expiry of the Existing Frequency Assignments for 3G Mobile Services" (28 December 2012) ("Second Consultation Paper").

II. "Option 1"

5. "Option 1" is the best of the three options currently on the table, because it would inflict the least disruption on end-users.

6. It is our submission that the public of Hong Kong should not be asked to sacrifice service continuity or service quality for the slender gains in competitiveness that a mandatory auction might or might not bring.

7. A key objection by OFCA to "Option 1" is that some of the 3G spectrum might possibly be assigned more efficiently than it is at present, despite incumbents' claims.[2] We would accept that this is logically a possibility, though it has not been proven as a fact. But if efficiency gains can be realized by fine-tuning the current spectrum assignments, then the correct way to accomplish that is by establishing a spectrum trading market, not by a mandatory re-auctioning of spectrum that is currently in use.

III. "Option 3"

8. "Option 3" would have strongly adverse consequences for Hong Kong's mobile services customers, as OFCA's own reasoning reveals.

9. The mandatory re-auctioning of all the spectrum in question under "Option 2" is rightly rejected by OFCA "…*in light of the potentially severe and long lasting effect on service quality and reception*…".[3] Mandatory re-auctioning under "Option 3" would involve similar severe effects, in relation to one-third of the relevant spectrum instead of all of it. The implications of that are strongly adverse, by OFCA's own analysis:

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2 OFCA *Second Consultation Paper*, para 33.

3 OFCA *Second Consultation Paper*, para 27.

- "*[I]t is certain that the decrease in network capacity of base stations due to spectrum loss will have impact on the continuity of calls or data connections…*".[4]

- If each operator loses one-third of its 3G spectrum, OFCA estimates download speeds would be reduced "*at most 18% on average during the transition period*".[5]

10. This 18% degradation estimate is based on an assumption of continuing investment by operators in the latest technology available,[6] which is a highly doubtful assumption: if operators face the risk that they will be deprived of spectrum that they are using, then it is improbable they will continue to invest in the latest technology to work in those bands that are at risk. OFCA reports that all incumbent operators opined that: "*[a]ny prospect of variation or withdrawal of the 3G spectrum would create regulatory uncertainty and as such a chilling effect on investment in the remaining period…*".[7] If, contrary to OFCA's assumption of continuing investment, investment were in fact to decline, then the degradation of services to the public would likely be significantly worse than even the 18 percent estimate suggests.

11. Having made some effort to quantify the expected degradation in service quality, it is very unfortunate that OFCA did not also endeavour to quantify either the costs of reduced call continuity or any possible countervailing benefit to the public which might justify the foreseen service degradation. <u>We submit that a thorough regulatory impact analysis is necessary to demonstrate to the public that OFCA is justified in taking the risk of causing serious service degradation</u>.

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4 OFCA *Second Consultation Paper*, para 24.

5 OFCA *Second Consultation Paper*, para 31.

6 OFCA *Second Consultation Paper*, footnote 10.

7 OFCA *Second Consultation Paper*, para 9.

12. The case for "Option 3" is based in part on the expectation that "…*under Option 3, the incumbents should be able to compete more efficiently*…"[8] but this forecast, with respect, seems extremely doubtful:

- As Hong Kong's mobile services market is already one of the very most competitive in the world, any possible increase in competition must necessarily be marginal – when competition is already so intense, there is only room for it to increase by a small increment.

- Under the auction rules OFCA proposes, OFCA acknowledges that "…*it is possible that the number of operators operating in the 1.9 – 2.2 GHz band may be reduced from four to three*".[9] The departure of one operator is unlikely to be pro-competitive or otherwise beneficial to end-users.

13. We submit that the public interest would be badly served by "Option 3." By OFCA's own estimates, "Option 3" asks the public to pay the price of certain service degradation in return for a forecast of increased competition -- which can only be regarded as marginal, speculative and uncertain.

14. Under "Option 3," the two-thirds of each incumbent operator's spectrum that will not be subject to mandatory re-auctioning would be re-assigned to each incumbent at a SUF of something more than zero or minimal cost (since "*[t]he SCED finds such a proposition totally unacceptable*."[10]) With 3G spectrum extensively licensed for use around the world, an SUF can readily be determined by benchmarking against a basket of selected comparators, without the need for any further auction in Hong Kong.

15. It is crucial to recognize that levying the highest possible spectrum fees does not maximize social welfare: "…*auction rules that focus on revenue extraction may*

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8 OFCA *Second Consultation Paper*, para 37.

9 OFCA *Second Consultation Paper*, para 66.

10 OFCA *Second Consultation Paper*, para 40.

conflict with the goal of maximizing social welfare."[11] This will always be so where extracting revenue from operators in the form of spectrum fees affects operators' ability and incentive to invest in service provision. An approach that realizes less SUF revenue may in fact make the public of Hong Kong better off, by enabling operators to deliver more and higher-quality services to the public.

16. Spectrum auctions are a useful tool but not the only tool available to a regulator. It is vital that their proper role and their limitations should be recognized.

17. The auctioning of spectrum was first proposed in the 1950s[12] and eventually adopted in New Zealand in 1989, India in 1991 and the USA in 1993.[13] Spectrum auctions have since been widely used around the developed world, as a means of harnessing market forces to achieve an efficient initial assignment of vacant spectrum. Auctions have clear advantages, when applied in their proper role:

> Auctions are generally superior to alternative rights-assignment mechanisms such as beauty contests or lotteries. Wireless licence auctions appear to assign licences to the most efficient network operators, and to have limited certain forms of rent dissipation.[14]

18. An auction may be <u>better</u> than a lottery or a 'beauty parade' but that does not mean it is the <u>best</u> approach. In fact, auctions are a very blunt tool to accomplish OFCA's policy objectives. This is particularly so in a context where flexibility in the use of spectrum and assignment of spectrum to its most efficient uses are considerably more pressing now than they were fifteen years ago.

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11 TW Hazlett and RE Munoz "A Welfare Analysis of Spectrum Allocation Policies" (2009) 40 RAND Journal of Economics 424-454.

12 Herzel L. "Public Interest and the Market in Color Television Regulation" (1951) 18 *University of Chicago Law Review*, 802-16; Coase, RH "The Federal Communications Commission" (1959) 2 *Journal of Law & Economics*, 1-40.

13 Crandall, RW "New Zealand Spectrum Policy: A Model for the United States?" (1998) 41 *Journal of Law & Economics*, 821-40; Jain, RS "Spectrum auctions in India: lessons from experience" (2001) 25 *Telecommunications Policy*, 671-88; McMillan, J. "Selling Spectrum Rights" (1994) 8 *Journal of Economic Perspectives*, 145-62.

14 TW Hazlett and RE Munoz "A Welfare Analysis of Spectrum Allocation Policies" (2009) 40 *RAND Journal of Economics* 424-454.

19. First, mandatory re-auctioning of spectrum every fifteen years or so will simply not ensure spectrum is efficiently assigned:

> [M]anaging spectrum has become increasingly difficult for regulatory agencies due to the new technologies and uses for spectrum that are continuously emerging and placing increasing demands on this resource. Thus, more flexible assignment mechanisms have to be put in place to adjust to this new reality while still achieving the best usage of the spectrum possible under economic or social welfare considerations.[15]

20. ICT and radio technologies and the needs of the community are certain to change in the periods between spectrum auctions. It is very much in the public interest for operators to be able voluntarily to buy and sell spectrum according to their business needs, independently of regulatory time horizons. This is essential, if operators are to be responsive to their customers' needs.

21. Secondly, once an auction has closed, the market for spectrum has ended and spectrum assignments are locked-in until the next auction is held:

> Once the auction is over, however, the licence holders do not get feedback about the current valuation of spectrum. For economically driven spectrum assignment to be effective, **a secondary market must exist** that allows spectrum users to optimally choose between capital investment and spectrum use on a continuous basis, not just at the time of the initial assignment.[16]

22. A market for tradable spectrum rights would allow continuous re-assessment by operators of their spectrum requirements and holdings, and adjustment of the latter, providing assurance that spectrum assignments continue to be efficient.

23. Thirdly, the objective under the 2007 Radio Spectrum Policy Framework of adopting "a market based approach" for spectrum assignment should not be mistaken as requiring auctions solely:

> "Market-based approach" for spectrum management means methods relying on market forces to ensure the efficient use of spectrum as a public resource.[17]

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15 Caicedo CE and Weiss MBH "The Viability of Spectrum Trading Markets" (2011) *IEEE Communications Magazine* 46 (emphasis added).

16 Ibid (emphasis added).

17 HKSAR Government, Commerce Industry and Technology Bureau *Radio Spectrum Policy Framework* (2007) note 1.

24. Spectrum trading is clearly a "market-based approach" and one that allows market forces to operate continuously, not just during the brief period that an auction is actually in progress.

25. In contrast to spectrum trading, mandating that an auction be conducted pursuant to "Option 3" would entail OFCA determining what spectrum is to be auctioned, when, and on what terms. Better outcomes (in social welfare terms) can be expected where these are determined by market forces rather than by the regulator. Spectrum trading allows market forces to have effect continuously.

26. It is highly regrettable, therefore, that OFCA proposes to postpone consideration of spectrum trading "*as a separate exercise*."[18]

IV. Spectrum Trading must Not be Further Postponed

27. We support OFCA in seeking to "*facilitate assignment of spectrum to the MNOs which value it the most and which can put it to the most efficient use*".[19] It is precisely this function that spectrum trading was developed to perform. Spectrum trading – which allows spectrum users to buy and sell blocks of tradable spectrum rights, in order to tailor their spectrum holdings to their needs -- is the correct regulatory tool for the current circumstances.

28. It is important to observe that spectrum trading is, like auctioning, "a market based approach", as required by the 2007 *Radio Spectrum Policy Framework*:

> [S]pectrum trading is a form of primary cooperative spectrum sharing that involves permanent licence transfers for economic consideration. Thus, it assigns spectrum to those who value it most, allowing for the establishment of dynamic market-driven and competitive wireless communication markets.[20]

29. The *Radio Spectrum Policy Framework* also states that:

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18 OFCA *Second Consultation Paper* Annex 1, para 15.

19 OFCA *Second Consultation Paper*, para 34.

20 Caicedo CE and Weiss MBH "The Viability of Spectrum Trading Markets" (2011) *IEEE Communications Magazine* 46.

> The policy inclination is to introduce spectrum trading in Hong Kong in the long term, subject to a feasibility study and resolution of various implementation issues.[21]

30. The *Radio Spectrum Policy Framework* was expressed as being "*a living document*" which would be "*…reviewed, revised, modified and updated from time to time…*".[22] In the six years since it was first issued, the pressures on Hong Kong's spectrum resources and the need for dynamic spectrum assignment have both grown significantly. Introduction of spectrum trading is now too pressing to be left to the "long term."

31. By creating a market in tradable spectrum rights, which operators can voluntarily buy and sell, spectrum is acquired by whoever values it most highly – whether a growing incumbent or a new entrant. And many of the problems associated with mandatory re-auctioning do not arise.

32. In a previous submission China Mobile Hong Kong Company Limited ("**CMHK**") argued that fairness requires that "*…it is of utmost importance that all interested parties shall be given an equal and fair chance to obtain such spectrum*"[23] and that this would be thwarted if incumbents have a right of first refusal, under Option 1. Renewing the incumbent operators' spectrum assignments in combination with establishing a market for tradable spectrum rights, however, would enable CMHK (or any other interested party) to obtain spectrum if it attaches to that spectrum at a greater value than does the incumbent.

33. If a spectrum trading market were established in Hong Kong, CMHK would be entirely free to bid for and buy 3G spectrum. If it considers it can use that spectrum more efficiently than the incumbent operators, then CMHK will attach a higher value to that spectrum than the incumbent operators attach to it. In this way, market forces decide who should hold spectrum, not the regulator – which

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21 Paragraph 5.3.

22 Paragraph 1.2.

23 China Mobile Hong Kong Company Limited "Supplemental Submissions: "Arrangements for the Frequency Spectrum in the 1.9-2.2 GHz Band upon Expiry of the Existing Frequency Assignments for 3G Mobile Services" (30 July 2012) para 4.

accords with the 2007 Radio Spectrum Policy Framework endorsement of a "market-based approach".

34. The work involved in designing and implementing a spectrum trading market in Hong Kong is non-trivial but other jurisdictions have already led the way. We submit that the potential gains for Hong Kong from a market for tradable spectrum rights which allows dynamic spectrum assignment, compared with the potential costs to Hong Kong of an inefficient mandatory re-auctioning process, make it imperative that a decision promptly be made to adopt "Option 1" together with a commitment to implement spectrum trading.

35. In order that such gains and costs can be stated explicitly and evaluated transparently, a thorough regulatory impact analysis is essential, and should be completed and published as a matter of urgent priority.

VI. RESPONSES TO SPECIFIC QUESTIONS

Question 1: No.

Question 2: With all of the 3G spectrum being reassigned on an "RFR" basis, the future SUF should be set by benchmarking against a basket of selected international comparators.

Question 3: No. Currently assigned spectrum should become tradable and should not be re-auctioned.

Question 4: The spectrum should not be re-auctioned.

Question 5: The spectrum should not be re-auctioned.

Question 6: The spectrum should not be re-auctioned.

Question 7: The spectrum should not be re-auctioned.

VI. CONCLUSION

36. In conclusion, we submit that OFCA should now proceed to:

- reconsider its current proposals in relation to the reassignment of 3G spectrum;
- re-evaluate the advantages of "Option 1" in combination with creation of a spectrum trading market; and
- perform a thorough regulatory impact assessment of the remaining options.

Confidentiality is not asserted in relation to the content of this submission.

Submitted for Certari Consulting Limited

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