

Comba Telecom Limited

Response to the Communications Authority and the Secretary for Commerce and Economic Development consultation paper –

Arrangements for the Frequency Spectrum in the 900 MHz and 1800 MHz Bands upon Expiry of the Existing Assignments for Public Mobile Telecommunications Services and the Spectrum Utilisation Fee

1 Summary

- 1.1 This response paper is prepared by Comba Telecom Limited (Comba) in response to the Communications Authority (CA) and the Secretary for Commerce and Economic Development (SCED) consultation paper dated 3 February 2016 on the arrangements for the frequency spectrum in the 900 MHz and 1800 MHz bands upon expiry of the existing assignments for public mobile telecommunications services and the spectrum utilisation fee.
- 1.2 Comba, as a part of the Hong Kong mobile telecommunications industry, supports the CA's policy objectives to ensure service continuity, to increase spectrum utilisation efficiency, to promote competition, and to encourage investment and innovation through reassigning the 900MHz and 1800MHz bands upon expiry.
- 1.3 Among the three options proposed by the CA, in our opinion, Option 1 and Option 2 are the most effective to achieving these objectives, while Option 3 appears to be the least.
- 1.4 Specifically, we believe that Option 1 –the full-fledged administratively-assigned approach– is the most direct way to ensure service continuity including the provision of 2G services and in-building mobile coverages.
- 1.5 Although Option 1 does not directly introduce any new competitions, it provides a stable environment for the mobile network operators (MNOs) to make long-term investments. We believe that even without any new competitions, the MNOs will continue to invest and innovate since they need to maintain their competitiveness in this already highly competitive market. That being said, we would also like to point out that Option 1 cannot increase the spectrum utilisation efficiency. Thus, if it is adopted, we recommend that the CA shall encourage the MNOs to consider spectrum swaps.
- 1.6 On the contrary, we believe that Option 2 –the full-fledged market-based approach– is the most effective way to increase the efficiency of spectrum utilisation since it will rearrange the currently 2G-orientated and fragmented spectrums. Furthermore, we agree that its market-based approach is theoretically the most direct way to promote competition and investment. However, we would like point out that currently there is insufficient empirical evidence to demonstrate that auctions of expired-spectrums (with full-rollout) will achieve the same market effect as auctions of green-spectrums that we have seen in the past.
- 1.7 In addition, we also would like to raise our concerns over Option 2's impacts to service continuity, in particular to the provision of 2G roaming for the inbound visitors. Moreover, we concern that Option 2 may affect the MNOs' investment (e.g., deploying in-building

mobile coverages) in the coming few years since it will introduce uncertainties to future of the 900MHz and 1800MHz bands. Hence, in the case that Option 2 is adopted, we suggest the CA may consider including the provision of 2G services and in-building mobile coverages in the rollout obligation.

- 1.8 In comparison, in our opinion, Option 3 appears to be the least preferable option in terms of achieving the CA's objectives. This is because we see that although it can partially achieve the effects of Option 1 and Option 2; it also inherits most of their drawbacks.
- 1.9 Finally, we would also like to raise our concerns over the CA's proposed method of setting the SUF/reserve price of the 900MHz and 1800MHz bands using the result of the recent spectrum auctions. This is because we have the impression that the SUF of the recent spectrum auctions were excessively high, which, in our opinion, is harmful to the industry as a whole. Specifically, from the perspective of a supplier, we apprehend that the MNOs might eventually have to reduce their investment and even transfer the cost to the suppliers. Therefore, we recommend that the CA may consider including other factors in the setting of the SUF/reserve price of the 900MHz and 1800MHz bands.

2 Introduction

- 2.1 Comba is supplier of wireless enhancement products and solutions to mobile network operators and enterprises. The company was established in 1997 and listed on the Hong Kong Stock Exchange in 2003. Growing together with the Hong Kong mobile telecommunications market, Comba has become one of the world's leading suppliers of wireless enhancement solutions and base station antenna with annual revenue of HKD 6,711 million in FY2015. The company's headquarters is based in Hong Kong and currently has more than 40 offices around the world.
- 2.2 With our root in Hong Kong, Hong Kong has always been one of Comba's most important markets. Since establishment, we have been providing our products and solutions to all the MNOs in Hong Kong and also enterprises such as MTR.
- 2.3 Thus, as a part of the Hong Kong mobile telecommunications industry, we welcome to opportunity to make this submission on the consultation paper raised by the CA and SCED regarding the arrangement of the 900MHz and 1800MHz bands upon expiry.

3 Specific Comments

Question 1: Given the CA's views that there are likely to be competing demands for the 900/1800 MHz Spectrum, is there any overriding public policy reason for the CA to consider not adopting a market-based approach pursuant to the Spectrum Policy Framework and to favour the full-fledged administratively-assigned approach (Option 1) for the Re-assignment of the 900/1800 MHz Spectrum?

- 3.1 On top of the continuous provision of 2G services, another factor that Comba suggests the CA to take into consideration is the provision of in-building mobile coverages.
- 3.2 Because of Hong Kong's high-density environment, over the years, MNOs in Hong Kong have deployed extensive in-building mobile coverages for the mobile subscribers. Mobile services are now available in almost all indoor and underground areas including public, commercial, and residential buildings, as well as MTR stations and tunnels.
- 3.3 Most of these coverages are achieved by dedicated systems known as 'In-Building System' (IBS) or 'Distributed Antenna System' (DAS). These systems combine the MNOs' signals and redistribute them over a passive or active distribution network. Most of these systems are shared by the MNOs and they usually cover all networks and frequency bands because of commercial and implementation reasons. We estimate that currently there are approximately 800 IBSs deployed in Hong Kong.
- 3.4 Because of their long history, both the 900MHz and 1800MHz bands are included in almost all deployed IBSs, as well as in the to-be-deployed ones such as the upcoming MTR South Island Line and Shatin-Central Line, as well as the Hong Kong-Guangzhou Express Railway. Thus, in the case a market-based approach is adopted, i.e., the incumbent MNOs become uncertain about the future of the 900MHz and 1800MHz bands, we concern that it may disrupt the provision of in-building mobile coverages in two ways.
- 3.5 First, the incumbent MNOs may become hesitate to continue to invest in IBSs until the allocations of these two bands are finalised. For instance, they may consider excluding these two bands in the deployment of new IBSs and/or delay the rollout. This will affect the provision of in-building mobile coverages to the subscribers and also affect the industry including suppliers like Comba, and also the system-integrators and subcontractors.
- 3.6 Second, the reassignment of the bands after the auction may result in massive deployment of new IBSs and/or modification of the existing ones. This, on the one hand will create many opportunities for the industry, which we, from the perspective of a supplier, welcome. On the other hand, since some of these IBS sites are difficult to access (e.g., MTR tunnels) or are already filled with equipment from existing networks, in the case a Greenfield operator is awarded with the license, they may not be able to rollout a competitive in-building mobile coverage in a short period of time. Hence, from the perspective of a mobile subscriber, we concern that it may distort the currently highly competitive market environment that all MNOs are offering similar level of in-building mobile coverages.
- 3.7 Therefore, although it is as strong as an override one, we still recommend that the CA to take the provision of in-building mobile coverages into account when considering adopting/not-adopting a market-based approach.

Question 2: What are your views on whether the full-fledged administratively-assigned approach (Option 1) would achieve the four identified objectives in the Re-assignment of the 900/1800 MHz Spectrum?

- 3.8 Comba believes that Option 1 –the full-fledged administratively-assigned approach- could directly achieve objective (a), indirectly achieve objectives (c) and (d). However, it has no effect on objective (b).
- 3.9 (a) Ensuring customer service continuity – in our opinion, Option 1 is the most effective way to ensure customer service continuity since it is the least disruptive to the current spectrum allocations. It provides a stable environment for the MNOs to continue to provide services (e.g., 2G services and in-building mobile coverages) to meet the market demand.
- 3.10 (b) Efficient spectrum utilisation – we, however, concern that Option 1 may not be able to promote efficient use of the spectrum. This is because as pointed out in the consultation paper, the 900MHz and 1800MHz were initially assigned for the less spectrum-efficient GSM system. Moreover, the current fragmented allocation of these two bands also hinders the deployment of high speed data services. Thus, in the case that Option 1 is adopted, we recommend the CA shall encourage the MNOs to consider swapping their spectrums to increase spectrum utilisation efficiency.
- 3.11 (c) Promotion of effective competition and (d) encourage of investment and promotion of innovation services – In our opinion, Hong Kong already has one of the world’s most competitive mobile telecommunications markets in terms of the number of MNOs, tariff levels, and level of services. Thus, although Option 1 will not directly introduce any new competitions to the market, we believe that it can still indirectly promote effective competition as it provides a stable environment for the MNOs to make long-term investment. This is because we assume that even without any new competitions, the MNOs will continue to invest to enhance their coverage and provide innovative services to maintain their competitiveness in this highly competitive market.
- 3.12 Overall, in our opinion, the main merit of Option 1 is that it can provide a stable environment for the MNOs, the industry, and the subscribers. However, we would also like to stress that it cannot direct increase the efficient of spectrum utilisation.

Question 3: Do you have any concerns about the continuity of customer services, in particular as regards the provision of 2G voice services, to local users and inbound visitors if the full-fledged market-based approach (Option 2) were to be adopted for the Re-assignment of the 900/1800 MHz Spectrum?

- 3.13 In the case that Option 2 –the full-fledged market-based approach– is adopted, Comba concerns that it may affect the continue provision of two 2G services, especially for the inbound visitors.
- 3.14 Specifically, while we assume that the local 2G subscribers can be gradually migrated to 3G/ 4G networks, Hong Kong, as an international city and the regional telecommunications hub, should accommodate the inbound visitors with seamless roaming service. In this context, we concern that since there may not be sufficient financial incentive for the Greenfield operators to deploy a legacy system, in the extreme case that

no incumbent MNOs are awarded with the 900MHz and/or 1800MHz bands, the provision of 2G roaming service for some inbound visitors will be affected.

Question 4: What are your views on the full-fledged market-based approach (Option 2) in achieving the four identified objectives in the Re-assignment of the 900/1800 MHz Spectrum?

- 3.15 Comba believes that Option 2 –the full-fledged administratively-assigned approach- is the most effective way to achieve objective (b), and theoretically can achieve objectives (c) and (d). However, it will have some negative impacts to objective (a).
- 3.16 (a) Ensuring customer service continuity – we concern that Option 2 may affect the continuous provision of customer services, especially 2G services and in-building mobile coverages that we point out in our responses to questions 1 and 3, respectively. Although we believe that these could be resolved by including the provisions of 2G services and in-building mobile coverages in the rollout obligation. This, however, this may reduce the auction’s attractiveness to the Greenfield operators.
- 3.17 (b) Efficient spectrum utilisation – in our opinion, Option 2 is the most effective way to promote the efficient use of the spectrum as it will rearrange the currently less efficient and fragmented allocations into a more efficient arrangement.
- 3.18 (c) Promotion of effective competition and (d) encourage of investment and promotion of innovation services – we agree that theoretically a market-based approach is the most direct way to promotion competition and to encourage innovation and investment. That being said, since the history of spectrum auctions is relatively young, currently, to the best of our knowledge, there is insufficient empirical evidence to demonstrate that auctions of expired bands (with full rollout networks) can achieve the same market effect as auctions of green bands that we have observed in the past.
- 3.19 Overall, in our opinion, the main strength of Option 2 is that it can directly increase spectrum efficiency and can theoretically promote competition and innovation. Although we have some concerns over its disruptions on service continuity, we still believe that it is a feasible approach to achieve the CA’s objectives.

Question 5: What are your views on the hybrid approach (Option 3) in achieving the four identified objectives in the Re-assignment of the 900/1800 MHz Spectrum?

- 3.20 Comba believes that in comparison with Option 1 and 2, Option 3 –the hybrid approach– is the least effective approach to achieve the CA’s four objectives.
- 3.21 (a) Ensuring customer service continuity – we agree that to a certain extent, by giving the right of first refusal to each of the incumbent MNOs of a portion (e.g., 2x5MHz) of the 900MHz and 1800MHz bands can ensure the continuous provision of 2G services. However, similar to Option 2, it will introduce uncertainties to the future of the remaining bands, which, in our opinion, may affect the incumbent MNOs’ investment for the two bands in

the coming years. Thus, as mentioned in our responds to Question 1, we concern that Option 3 may disrupts the provision of in-building services.

- 3.22 (b) Efficient spectrum utilisation – similar to Option 2, we believe that Option 3 can also increase the spectrum utilisation efficiency.
- 3.23 (c) Promotion of effective competition and (d) encourage of investment and promotion of innovation services – similar to Option 2, we anticipate that Option 3 can also theoretically promote competition and investment. However, unlike Option 2, in the case of Option 3, the incumbent MNOs will have the right of first refusal to a portion of the bands. In our opinion, this may distort the auction’s outcome. Specifically, on the one hand, it may encourage the incumbent MNOs to bid aggressively to obtain addition spectrums such that they can provide the more profitable 3G/4G/5G services to cover the less profitable but compulsory 2G services. On the other hand, it may also reduce the new entrants’ opportunities to obtain a wide continuous band to provide high speed data services since they can only bid on the RSR bands after the incumbent MNOs refused them.
- 3.24 Overall, in our opinion, despite Option 3 can achieve part of the effects of Option 1 and 2, its effects, however, are less direct. Moreover, it inherits most of the drawbacks of both Options 1 and 2.

Question 6: Would you consider the proposed arrangement to set aside 2 x 5 MHz of the 900/1800 MHz Spectrum as the RFR Spectrum for each of the four MNOs to ensure continuous provision of 2G services during the first three years of the new spectrum assignment term too much, too little or about right? Is there any arrangement other than the provision of RFR Spectrum to each of the four MNOs would also ensure continuity of 2G services for a reasonable period of time in the new 15-year spectrum assignment term?

- 3.25 Regarding the second part of Question 6, we suggest that instead of providing RFR spectrum to the incumbent MNOs, the CA may also consider including the provision of 2G services for a period of time in the rollout obligation, especially in the extreme case that no incumbent MNOs are awarded with the 900MHz and 1800MHz bands.

Question 7: Among the four hybrid sub-options, what is your preference and why? Do you have any other variants to the hybrid option you would like to suggest, and if so, what are the details and the justifications?

- 3.26 We have no comments on Question 7.

Question 8: What are your views and comments on the principles and methods of setting the SUF as proposed in paragraphs 64 to 75 above?

- 3.27 Comba agrees that spectrum is scarce public resource and the SUF shall reflect its full market value; however, we have some concerns over the proposed way of setting the SUF/reserve price.
- 3.28 According to paragraphs 64-75 in the consultation paper, the SUF (in the case of Options 1 and 3) and the reserve price (in the case of Options 2 and 3) are proposed to set according to the result of the recent spectrum auctions. These recent auctions, especially the auctions of the 800/900MHz and 1.9-2.2MHz bands, in our impression, had resulted in excessively high SUFs.
- 3.29 In our opinion, an excessively high SUF is harmful to the industry as a whole. Specifically, we concern that as mobile services have become a commodity, the MNOs' revenue sources are limited, thus in order to sustain the excessively high SUF and to maintain profitability, they eventually might have to reduce their investment, transfer the cost to the suppliers and even to the subscribers. From the perspective of a supplier, this will increase the pressure to this already highly competitive and price-sensitive market.
- 3.30 We speculate that the recent auctions were inflated because the 800/900MHz and 1.9-2.2MHz bands were used by existing networks, thus it is natural that the incumbent MNOs who have invested heavily in these bands to bid aggressively and as a result, inflated the auctions' outcome. The fact that the winners of the 800/900MHz and 1.9-2.2MHz bands auctions were all incumbent MNOs supports our speculation.
- 3.31 Thus, in the case that the SUF/reserve price of the 900MHz and 1800MHz bands refer to the results of the 800/900MHz and 1.9-2.2MHz auctions as reference. First, in the case of Option 2 or 3, in our opinion, a high reserve price may deter the new entrances to participate in the auction. Second, since the 900MHz and 1800MHz bands have an even longer history than the 800/900MHz and 1.9-2.2MHz bands, we anticipate that the incumbent MNOs will become even more compelled to secure them. As a result, they will have to bear a high SUF for the 900MHz and/or 1800MHz bands on top of high SUF of the recent auctioned bands. This outcome, we apprehend, will further increase the MNOs pressure to cut down on investment and/or transfer the cost to the suppliers and subscribers.
- 3.32 Therefore, we recommended that the CA may consider taking other factors (e.g., the MNOs profitability, auction results of other countries) into account in the setting of the SUF/reserve price instead of referring solely to the outcomes of the recent auctions.

Question 9: Do you agree that in devising the band plan, priority should be given to frequency slots of 2 x 10 MHz each for spectrum in the 1800 MHz band? Do you agree that the band plan in the 900 MHz band should be restructured into frequency slots of 2 x 5 MHz each?

3.33 Comba agrees the proposed arrangements for both the 900MHz and 1800MHz bands.

Question 10: Do you agree that the Auctioned Spectrum should be open for bidding by all interested parties, including the incumbent spectrum assignees and new entrants?

3.34 We have no comments on Question 10.

Question 11: What are your views on the proposal to impose a spectrum cap and the proposed cap level of 90 MHz?

3.35 Comba agrees that a spectrum cap is necessary; however, we concern that the proposed cap of 90MHz might be too high. This is because the total spectrum for auction is only 200MHz, thus in the extreme case that two MNOs have obtained 90MHz (the cap), it will create a much less competitive market environment comparing with today's situation. Hence, in our opinion, the spectrum cap should be set between 50MHz to 70MHz.

Question 12: Do you consider it necessary to introduce a sub-cap for the 900 MHz spectrum within the overall spectrum cap of 90 MHz? If the answer is yes, is the proposed sub-cap at 20 MHz suitable?

3.36 We have no comments on Question 12

Question 13: What are your views on the proposed arrangements to align the 15-year term of the new assignments for the spectrum in the 900 MHz band to commence on 12 January 2021, and to have the new 15-year assignment term for the spectrum in the 1800 MHz band to commence on 30 September 2021?

3.37 We have no comments on Question 13

Question 14: Do you agree that the SUF for the extended period of assignments shall be determined in accordance with the method as set out in paragraph 88 above?

3.38 We have no comments on Question 14

Question 15: What are your views on the network and service rollout obligation and performance bond requirement proposed to be imposed on the assignees of the 900/1800 MHz Spectrum in their provision of public mobile telecommunications services under the new term of frequency assignments?

3.39 As stated in our responses to Question 4, we suggest the CA may also consider including the provision of in-building mobile coverages in the service rollout obligation.