Submission in Response to:

Third Consultation Paper on Providing Radio Spectrum for Broadband Wireless Access Services

18 July, 2007

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EXECUTIVE SUMMARY

1. In this Consultation Paper, OFTA discusses the growing interest in Broadband Wireless Access ("**BWA**") services. OFTA regards BWA as complementing existing wireless services in Hong Kong and taking up some of the demand for portable devices currently driven by 3G mobile and WiFi services. Overall, it appears that OFTA sees some urgency in moving forward with the release of spectrum and licensing for BWA services, firstly in the 2.3 GHz band and then (most likely) in the 2.5 GHz band.

2. PCCW-HKT Telephone Limited ("**PCCW**") supports the roll out of BWA services for both fixed and mobile services. PCCW would, however, caution against having two separate BWA spectrum auctions just months apart. Instead of a piecemeal approach, there should be a comprehensive approach where all the relevant spectrum is auctioned at the same time. Whilst this would mean slightly delaying the auction of the 2.3 GHz spectrum, this would allow investors to make better bidding decisions. Such a delay should not cause any significant problems.

3. Experience in certain countries around the world demonstrates that there is no need to rush the introduction of BWA services by adopting a two phase auction approach (i.e. two separate spectrum auctions). For instance, in New Zealand, the auction of spectrum in the 2.3 GHz band has been pushed back until the end of this year to coincide with the spectrum auction for the 2.5 GHz band.

4. In South Korea, despite the licensing of BWA services two years ago in 2005, today, customer uptake is still abysmal. One of the three licensees has already dropped out of the market and equipment supply is still sparse, with some experts claiming that suitable devices will not become available until over a year from now. Clearly, the South Korean market, which is normally an early adopter of new technology, was not yet ready for BWA. The similarities with the introduction of 3G mobile services in Hong Kong is fairly apparent in terms of both customer numbers and handset availability.

5. On this basis, PCCW suggests that more time is taken to:

(i) Review the development of BWA services in other countries before proceeding with its introduction in Hong Kong. This should be acceptable given that, in any case, the Telecommunications Authority ("**TA**") does not intend to make any decisions regarding use of one of the proposed spectrum bands (i.e. 2.5 GHz) for BWA services until later on this year after the World Radiocommunication Conference 2007 ("**WRC-07**").

(ii) Make a comprehensive decision on both 2.3 GHz and 2.5 GHz for BWA services.

6. Should the TA nevertheless decide to proceed with the piecemeal introduction of BWA services then, consistent with his recent pronouncements to withdraw from

regulating the market, he should permit the market itself to make its own decisions regarding the use of spectrum and licensing for BWA services.

7. In response to the major issues raised by OFTA in the Consultation Paper, PCCW therefore considers that:

- Pending decisions regarding the use of the 2.5 GHz band at WRC-07 in October this year, spectrum in the 2.3 GHz and 2.5 GHz bands should be made available for BWA services (and released at the same time) in order to ensure that interested operators have access to the maximum amount of information relating to the frequency bands and the quantity of spectrum available, and that both bands are identically treated.

- No limitations should be placed on the amount of spectrum that can be obtained by each licensee. The market, via the competitive auction process, will decide which operators are granted spectrum and how much spectrum is assigned to each successful bidder. Any hoarding issues can be addressed under Sections 7K or 7L of the Telecommunications Ordinance as the TA has previously noted.

- No restrictions should be placed on the types of applications that may be offered using the BWA spectrum or the technical standards to be deployed by the licensee. Market demand will drive the services that will be supplied by the BWA service providers.

- A competitive auction is the best way to determine which party is assigned the spectrum. Successful bidders should be required to pay an up front lump sum Spectrum Utilization Fee. Such a market-based approach is consistent with the principles identified in the Government's *Radio Spectrum Policy Framework*[1]. Once the spectrum is obtained, operators should be permitted to use the frequency bands on a territory-wide basis.

- Whilst BWA licensees should be required to roll out service within 24 months of obtaining their licence, their service roll out obligations need not require them to cover the whole of Hong Kong. The roll out requirements specific to each operator should be clearly specified up front.

- Consistent with the approach recently adopted by the TA in the licensing of CDMA2000 services[2], no Open Network Access ("**ONA**") requirement should be imposed on the BWA licensees. In fact, to ensure fair play, the 2G and 3G mobile operators should now be relieved of their existing ONA obligations.

[1] Released by the Commerce, Industry and Technology Bureau on 24 April 2007.

[2] See Statement issued by the TA on 27 April 2007 on *Licensing of Spectrum in the 850 MHz Band to enable the Provision of CDMA2000 Service*.

- To minimize customer confusion, if possible, a distinct number range should be used for converged fixed-mobile services, such as BWA services, since these services can be either fixed or mobile in nature. Number portability should not be imposed as a requirement; whether this is needed or not will ultimately be decided by the market.

8. In short, the market should be trusted as to who is awarded the spectrum, the amount of spectrum obtained by each operator, how that spectrum is used, the auction price and roll outs.

INTRODUCTION

9. PCCW-HKT Telephone Limited ("**PCCW**") welcomes the opportunity to provide its comments on the Third Consultation Paper issued by the Office of the Telecommunications Authority ("**OFTA**") on 11 May 2007 in respect of *Providing Radio Spectrum for Broadband Wireless Access Services* ("**Consultation Paper**").

10. Two rounds of consultation have already been conducted by OFTA on this subject matter[3]. In this current consultation paper, OFTA considers the responses previously made by the industry and raises further questions regarding the spectrum, licensing and technical issues pertaining to the provision of Broadband Wireless Access ("**BWA**") services. PCCW addresses these detailed matters in the main body of this submission.

Timing for BWA Services

11. At the outset, PCCW is wary of the urgency with which OFTA is seeking to release spectrum for, and license, BWA services. The availability of equipment for BWA services and the pricing of such equipment today do not yet provide potential service providers in Hong Kong with a clearly viable commercial proposition. At the same time, adopting a piecemeal approach to auctioning the 2.3 GHz and 2.5 GHz spectrum bands makes the auctions more unpredictable and inefficient.

12. The lack of success experienced by WiBro[4] services in South Korea illustrates the critical importance of getting the timing right. In South Korea, three licences were issued for WiBro services in the 2.3 GHz band in 2005. Korea Telecom ("**KT**"), SK Telecom ("**SKT**") and Hanaro Telecom ("**HT**") each received a licence. KT and SKT launched their WiBro services at the end of June 2006, but HT cancelled its plans to launch service, effectively exiting the market for WiBro services. Today, customer uptake of WiBro services in South Korea is still low[5]. Market commentators have remarked that this is because of:

- Limited geographical service coverage;
- Little service differentiation with 3.5G mobile services;
- Limited handsets/ products for consumers; and
- Lack of customer demand.

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[3] See consultation paper on *Licensing Framework for Deployment of Broadband Wireless Access* issued on 20 December 2004 and consultation paper on *Licensing Framework for Deployment of Broadband Wireless Access – Analysis of Comments Received, Preliminary Conclusions and Further Consultation* issued on 31 August 2005 ("**Second Consultation Paper**").

[4] WiBro is a **Wi**reless **Bro**adband Internet technology developed by the Korean telecommunications industry.

[5] In November 2006, KT reported that it only had 1,300 WiBro customers.

Clearly, the South Korean market, which is ordinarily an "early adopter" of new technology, was not yet ready for BWA.

13. The lack of availability of BWA equipment capable of operating in the 2.3 GHz band does not appear to be a problem which is confined to South Korea. In Singapore, for instance, when the BWA licences were awarded in 2005, operators using the 2.3 GHz spectrum band were only required to roll out service within 36 months (as opposed to 18 months for the 2.5 GHz band) because the regulator recognized the difficulty in securing suitable equipment. PCCW's own experience in the UK market reflects a similar result. Indeed, one may even recall the 3G mobile experience in Hong Kong and see the same outcome.

14. Analysys predicts that the future success of WiMAX[6] in Hong Kong is likely to rest on the mobile version of this technology, but that remains some eighteen months away due to the lack of availability of certified equipment[7].

15. PCCW would therefore urge OFTA to review its intended timetable for the licensing of BWA services (particularly those using the 2.3 GHz band) in order to ensure that Hong Kong does not make the same mistakes as those countries that have gone before.

16. As OFTA is proposing to wait for the outcome of discussions at the World Radiocommunication Conference 2007 ("**WRC-07**") in October 2007 before deciding on whether one of the proposed spectrum bands (i.e. 2.5 GHz) should be used for BWA services, perhaps it would also be sensible to wait at least until October before making any decisions regarding the release of spectrum for BWA services.

17. In fact, this is exactly the approach adopted in New Zealand where the auction of spectrum in the 2.3 GHz band for WiMAX services has been pushed back until the end of this year so that the spectrum can be offered alongside frequencies in the 2.5 GHz range. Doing so would maximize the amount of spectrum on offer at one time to interested operators, ensure that the approach adopted for frequencies in the 2.3 GHz is the same as that taken in the 2.5 GHz band, and allow investors to construct one comprehensive bidding strategy for BWA services.

Response to Questions in Consultation Paper

In the ensuing sections, PCCW responds to the specific questions raised in the Consultation Paper.

[6] WiMAX refers to **W**orldwide **I**nteroperability for **Mi**crowave **Acc**ess, which is a technology developed to provide wireless data over long distances. It enables the delivery of last mile wireless broadband access as an alternative to cable and DSL.

[7] Refer to remarks made by Analysys Consulting Pte Limited at the Telecoms InfoTechnology Forum held on 8 February 2007 concerning "WiMAX Market Developments".

SPECTRUM AVAILABILITY

18. In this section of the Consultation Paper, OFTA examines the choice of frequency bands available for BWA services, the timing of the availability and the amount of spectrum that can be allocated.

Frequency Bands

19. In the previous consultation papers issued by OFTA on this subject matter, OFTA had proposed the use of the 3.5 GHz band for the provision of BWA services. After conducting a series of technical assessments, however, the Radio Spectrum Advisory Committee ("**RSAC**") concluded that the deployment of BWA services in the 3.5 GHz band would cause interference to Fixed Satellite Services ("**FSS**"), and to implement measures to protect FSS would render it difficult for BWA services to be deployed on an extensive and cost effective basis in Hong Kong. The TA has therefore decided not to consider the 3.5 GHz for BWA services for the time being. PCCW supports this decision.

20. Instead, in this Consultation Paper, OFTA puts forward two other spectrum bands for consideration: 2.3 GHz and 2.5 GHz, both of which are gaining momentum around the world. The RSAC has also confirmed these two bands as being suitable for BWA deployment.

2.3 GHz Band

21. This band has been, or will soon be, deployed for BWA applications around the world. In the Mainland, the 2.3 GHz band is allocated for fixed, mobile and radiolocation services, and has been earmarked as the future expansion band for TD-SCDMA mobile services. If this band is to be used for BWA services in Hong Kong, therefore, its use must be coordinated with the Mainland authorities in order to avoid potential radio interference due to excessive signal overspill at the border between Hong Kong and Guangdong Province.

22. In the Consultation Paper, OFTA asks:

Question (1): Do you agree that the 2.3 GHz band be allocated for BWA services ?

If agreed, when the spectrum should be made available ?

23. As explained in the Consultation Paper, mobile WiMAX equipment currently being produced is capable of working in the 2.3 GHz band. Some countries are also already using or planning to use this band for BWA services. It would therefore seem logical for Hong Kong to make use of this band (as one of a number of bands) to offer BWA services.

24. If the 2.3 GHz band were to be used in Hong Kong, the signal overspill problem would obviously need to be resolved between OFTA and the Mainland authorities, but this should not be a difficult matter since similar arrangements have already been established to curb the power of transmitted signals for mobile services at the border between Hong Kong and the Mainland in order to ensure that there is no excessive overspill.

25. At the moment, the TA is only proposing to make available spectrum in the 2.3 GHz band for BWA services because the use of the 2.5 GHz band is still undecided pending the results of discussions at the WRC-07. Furthermore, within the 2.3 GHz band, only 85 MHz can be used for providing services since certain frequencies need to be set aside for guard bands.

26. This effectively means that if the TA were to move ahead with the release of spectrum for BWA services today, only a very limited amount of frequency could be made available to interested operators. On the other hand, should the TA wait for the outcome of discussions regarding the 2.5 GHz band arising from the WRC-07, more spectrum may be released at the same time in order to satisfy demand.

27. On this basis, PCCW sees considerable merit in the TA releasing all the available spectrum for BWA services in one go instead of in stages, thereby ensuring a level playing field for all interested BWA service operators and potential bidders for the spectrum. This would require the TA to await the outcome of the WRC-07 discussions on the 2.5 GHz band before releasing spectrum in the 2.3 GHz range, which should not be an onerous request given that the Conference is merely a matter of months away.

2.5 GHz Band

28. This band has been identified by the International Telecommunications Union as being for the expansion of 3G mobile services. Some countries, however, have sought to use this band for BWA services, e.g. Taiwan, Singapore, USA. In addition, the use of the 2.5 GHz band will be a specific topic of discussion at the WRC-07. The TA therefore considers it appropriate to wait for the outcome of the WRC-07 before deciding on the use of the 2.5 GHz band for BWA services.

29. In the Consultation Paper, OFTA asks:

Question (2): ***Do you agree that the opening up of the 2.5 GHz band for BWA should be considered at a later stage ?***

If agreed, when and how much of the bandwidth should be made available to the market ?

30. As there are competing demands from mobile 3G, BWA and mobile televisions services for use of the 2.5 GHz band, PCCW agrees that it would be preferable to wait for the outcome of discussions on the 2.5 GHz band at the WRC-07 before deciding whether or not this band should be used for BWA services. To be

clear, PCCW sees the best way forward to be a release of both 2.3 GHz and 2.5 GHz at the same time, once WRC-07 has completed its review later on this year.

31. In fact, as PCCW has already stated, ideally, no spectrum should be released in any of the proposed bands for BWA services until after the WRC-07 when the TA would be in a better position to assess the suitability of the timing for BWA services and the total amount of spectrum he can make available for such services on the market. This would result in a more consistent approach that creates a level playing field for all future BWA service providers. A piecemeal approach to spectrum allocation offers no advantages to either investors or users.

32. As PCCW considers that a minimum of 40 MHz (2 x 20 MHz) spectrum is necessary in order to offer a comprehensive BWA service, PCCW would support a maximum amount of spectrum in the 2.3 GHz and 2.5 GHz bands being made available to the market for the provision of such services.

33. In concluding this section, OFTA asks:

Question (3): ***Do you have any preferred frequency bands for BWA services ?***

How much spectrum do you need initially and for future expansion (number of blocks, spectrum width of each block, in which bands) and when the spectrum should be made available to the market ?

34. PCCW would let the market make this decision. If a successful bidder decides that the 2.3 GHz band or the 2.5 GHz band should be used for BWA services then this outcome will be reflected in the spectrum auction and should be accepted (consistent with any interference management safeguards).

35. PCCW is still in the process of studying the opportunities afforded by BWA technology and hence is not yet in a position to confirm exactly how much spectrum it would require in order to offer BWA services.

36. Whilst PCCW sees no reason for the introduction of BWA services to be unduly delayed in Hong Kong, it would, nevertheless, caution against the TA releasing the spectrum too early as this may have an undesirable effect on the development of the BWA services if the timing is premature[8]. Adopting a more cautious approach would allow the TA to conduct one comprehensive auction and to study the experience of introducing BWA in other countries. This would also indirectly allow more time for the technology to develop.

[8] Refer to limited success of BWA services in South Korea.

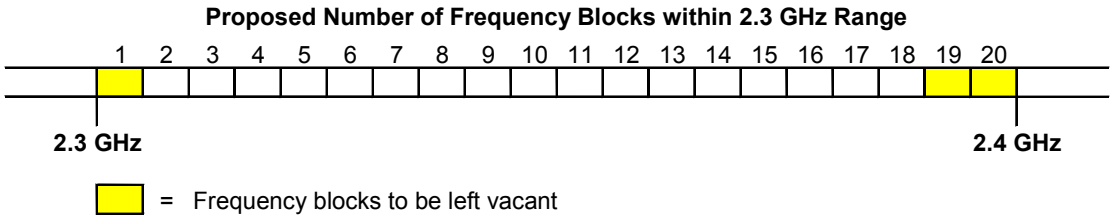
Potential Supply of Spectrum

37. In this section of the Consultation Paper, OFTA deals with the size of the frequency blocks within the selected spectrum range and the number of blocks to be allocated to each operator to enable the provision of BWA services.

2.3 GHz Band

38. OFTA notes that mobile WiMAX equipment based on the IEEE 802.16e-2005 standard can support block sizes of 5 MHz, 8.75 MHz or 10 MHz. It would therefore make sense to adopt a block size in Hong Kong which is compatible with equipment being used.

39. For the 2.3 GHz band, OFTA proposes splitting this frequency range into 20 blocks of 5 MHz each, with 17 of these blocks (block number 2 to 18) being used to offer BWA services. This would result in a total of 85 MHz of spectrum being made available. The remaining blocks at each end would be used to separate the BWA service from other services as illustrated below per Annex 1 of the Consultation Paper:



40. In the Consultation Paper, OFTA asks:

Question (4): ***Do you agree with the proposed frequency allocation plan given in Annex 1 ?***

If not, what is your proposal ?

41. PCCW agrees with the TA's proposal to adopt frequency blocks of 5 MHz each. Dividing the total frequency range into such small units provides the operator with greater flexibility when bidding for spectrum and offering service. The proposed block size is also consistent with that which can be supported by WiMAX equipment.

42. PCCW notes, however, that in the frequency allocation plan proposed by the TA, an asymmetrical number of frequency blocks are left vacant at each end of the 2.3 GHz range. This is to accommodate guard bands. PCCW discusses this issue later on in this submission.

43. OFTA proposes that operators may be allocated more than one frequency block, depending on the type of service being offered. For instance, 10 MHz would be sufficient to provide fixed broadband wireless access services, whereas an operator intending to provide a territory-wide, commercially viable mobile BWA service may need 30 MHz of bandwidth. OFTA therefore envisages operators being allowed to bid for no more than six frequency blocks of 5 MHz each, making a maximum allocation to each operator of 30 MHz. This effectively means that up to three BWA operators may be licensed in the 2.3 GHz range.

44. If demand is insufficient to utilize the entire spectrum range or parts of the spectrum are not initially usable because of radio interference with the Mainland, then the TA may consider withholding part of the frequency band.

45. In the Consultation Paper, OFTA asks:

Question (5): Do you agree that a BWA licensee should be assigned no more than six 5 MHz blocks of the BWA spectrum ?

46. PCCW's initial thinking is that at least 40 MHz of spectrum may be needed to offer a comprehensive BWA service. The maximum of 30 MHz (6 x 5 MHz blocks) spectrum proposed by the TA may therefore not be sufficient to enable a good quality service to be provided.

47. As only a total of 85 MHz of spectrum will be made available in the 2.3 GHz range, this only allows for a maximum of three BWA service providers. It is interesting to note in this regard that the regulators in New Zealand and Taiwan intend to offer six WiMAX licences when spectrum is auctioned. This would only be possible in Hong Kong, however, if spectrum in the 2.3 GHz band were offered alongside spectrum in the 2.5 GHz range. Clearly, this is another reason to push back the auction for the 2.3 GHz band until later on in the year when decisions have been made regarding the 2.5 GHz range.

48. In any case, PCCW sees no reason why limitations should be imposed on the amount of spectrum that can be assigned to a licensee. In a market-driven approach, operators decide on how much spectrum they need to offer service and the market determines how much they pay for those frequency bands. There should be no artificial restriction on the amount of spectrum that can be obtained by each operator. The competitive bidding process will naturally decide who gets the spectrum and how much spectrum is assigned to each licensee.

49. OFTA then asks:

Question (6): ***If the result of the coordination with the Mainland authorities confirms that 85 MHz bandwidth in the 2.3 GHz band can be made available, do you agree that the TA should make available all the 85 MHz bandwidth for BWA service ?***

If not, what is your proposal with reasons ?

50. PCCW believes that the maximum amount of spectrum needs to be made available in one go in order not to restrict the amount of spectrum that can be obtained by each operator or the number of operators bidding for the spectrum. This will ensure a level playing field in the market for BWA services. That is why PCCW would prefer the spectrum in the 2.3 GHz band to be made available along with the 2.5 GHz band, since this would then maximize the total amount of frequency that will be offered onto the market in a comprehensive fashion.

2.5 GHz Band

51. As the TA may wait for the outcome of the WRC-07 before deciding on the use of the 2.5 GHz band for BWA services, he has suggested that it may be too early to decide on the detailed arrangements within the band regarding block size and number of blocks to be allocated to each operator.

52. Nevertheless, in the Consultation Paper, OFTA asks:

Question (7): ***Do you have any views on the frequency allocation plan for the 2.5 GHz band ?***

53. PCCW has no specific comments on the detailed frequency allocation plan for 2.5 GHz at this point in time. Suffice to say that if the TA decides to proceed with his proposal to divide the available spectrum in the 2.3 GHz band into 5 MHz blocks, and award a maximum of 6 blocks to each successful operator, then this frequency allocation plan should also be applied to the 2.5 GHz band in the interests of consistency.

54. PCCW would like to reiterate, however, its preference for the maximum amount of frequency to be made available and that spectrum in the 2.5 GHz band be offered alongside frequency in the 2.3 GHz band in order to ensure that there is sufficient spectrum available to all operators interested in providing BWA services.

LICENSING ISSUES

55. In the Second Consultation Paper, OFTA proposed that BWA services should be licensed under a newly created Unified Carrier Licence ("**UCL**"), which would cover both fixed line and mobile services. OFTA considered this type of licence appropriate for BWA services since it envisaged BWA technology being used to offer fixed line as well as mobile services.

56. As it has now been confirmed that a new UCL will be established[9], the TA advises in this Consultation Paper that BWA services will be licensed under the UCL and that the term of the licence shall be for fifteen years.[10]

57. In the rest of this section, OFTA discusses other licensing issues pertaining to the provision of BWA services.

Scope of Permitted BWA Services

58. The TA had previously proposed that BWA services would initially be restricted to fixed telecommunications services and only expanded to include full mobility services at a later date when the technology was more developed.

59. In view of the fact that the TA does not foresee BWA licences being issued before 1 January 2008, however, this should give BWA technology more time to develop. The TA has now therefore sought to revise his proposals so that no restriction is placed on the type of services that may be offered by the licensee, i.e. fixed line, mobile or converged fixed-mobile services may be provided.

60. In the Consultation Paper, OFTA asks:

Question (8): Do you have any comment on the TA's preliminary view that no restrictions should be imposed on the types of applications and services that may be provided using the BWA spectrum ?

61. PCCW concurs that no restrictions should be placed on the types of applications and services that may be offered using the BWA spectrum. In fact, PCCW supports a general policy of spectrum liberalization and would encourage the TA to implement such an approach as soon as possible. This would be consistent with the market-driven policy and "let the market decide" approach which the TA has been advocating and seeking to implement in recent years.

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[9] See Statement by the TA on *Deregulation for Fixed-Mobile Convergence* ("**FMC**") issued on 27 April 2007.

[10] Whilst not specifically addressed in the Consultation Paper, PCCW would propose that the term for which the spectrum for BWA services is granted correspond with the term of the licence, i.e. fifteen years.

Standard Issues

62. Consistent with technology neutral principles, the TA maintains his view that no particular standard or technology should be prescribed for the provision of BWA services provided that the selected technology conforms to recognized open standards and is compatible with the use of the spectrum allocated.

63. In the Consultation Paper, OFTA asks:

Question (9): Do you have any further comments on the preliminary view of the TA that he should not prescribe any particular standard or technology for the BWA deployment ?

64. In line with a market-driven approach, PCCW agrees that no particular standard or technology should be prescribed by the TA for BWA deployment. Operators should be able to choose whichever standard or technology they see fit to provide their BWA (or other) services, consistent with interference management requirements.

Territory-wide Assignment

65. The TA intends to maintain his position that spectrum assignment for BWA services be made on a territory-wide rather than regional basis, since this would avoid the regional frequency over-spill problems that are likely to arise as a result of Hong Kong being such a small geographical area and the wide coverage of a BWA cell.

66. In the Consultation Paper, OFTA asks:

Question (10): Do you have any further comments on the TA's preliminary view that assignment of the frequency blocks for BWA services should be made on a territory-wide basis ?

67. Hong Kong is such a small and densely packed city that it would be impractical to assignment frequency blocks on a regional basis. Doing so would likely lead to over-spill problems and require a considerable amount of coordination between the service providers. On this basis, territory-wide assignment of the spectrum is the best option.

Roll-out Obligation

68. In the Second Consultation Paper, the TA proposed that BWA licensees be given a timeframe of 24 months to roll out their services, whether this be the provision of full mobile services or simply restricted to the provision of "last-mile" access to fixed line customers.

69. The TA considered it necessary to impose this obligation as spectrum is a limited public resource and consumers would expect services to be available within a reasonable period of time after spectrum is awarded.

70. The TA proposes to maintain his position on these matters. In addition, to ensure that these roll out commitments are met, the TA suggests that a performance bond be required from the licensees.

71. In the Consultation Paper, OFTA asks:

Question (11): Do you have any further comments on the TA's preliminary view that BWA licensees will be required, under the licence, to roll out the services within 24 months from the date when the licence is issued and that performance bond will also be required ?

72. PCCW considers the obligation to roll out service within 24 months to be reasonable. It is important, however, for the TA to clearly specify up front the extent of the service roll out expected from the operators. The service roll out requirements need not be confined to geographical coverage. For instance, in Singapore, no nationwide roll out obligation was imposed on the operators, leaving each service provider to decide on their preferred areas for service deployment. Similarly, in Taiwan, it is understood that the regulator will impose very relaxed geographical roll out requirements on the prospective BWA licensees. Ideally, any roll out obligations should take into account the anticipated state of technological development and equipment availability during the 24 month roll out period.

73. It would also be helpful to interested operators if the TA could elaborate on the consequences of failing to meet the prescribed roll out obligations in whole or in part, e.g. what happens to the performance bond ?

Spectrum Assignment Method

74. The *Radio Spectrum Policy Framework* recently released by the Commerce, Industry and Technology Bureau[11] established the guiding principle that a market-based approach would be used in managing spectrum wherever the TA considers that there are likely competing demands for the spectrum from providers of non-Government services.

75. Consistent with this principle, the TA maintains his preliminary view that BWA spectrum should be assigned to operators using a hybrid selection method including a simple pre-qualification stage followed by an auction.

76. In the Consultation Paper, OFTA asks:

[11] Issued on 24 April 2007.

Question (12): Do you agree with the proposed frequency assignment method as stated above ?

77. Consistent with open market principles, frequency bands should be awarded to those operators who bid the most. These operators are, in theory, most in need of the spectrum and hence place the highest value on the spectrum. The most appropriate way of ensuring that this occurs is via a simple pre-qualification and competitive auction process. This approach has already been adopted by the TA in the past and he has already confirmed that the same approach will be taken in specific future spectrum assignments, e.g. for CDMA2000 services. It is also an internationally accepted approach. Accordingly, PCCW concurs with the hybrid frequency assignment method proposed by the TA.

78. PCCW would, in addition, like to suggest that, as part of the auction process, operators should be permitted to specify the frequency blocks for which they wish to bid, and this information should not be made known to other operators. This would naturally result in those frequency blocks with greater demand being awarded at a higher price.

Spectrum Utilization Fee Payment Method

79. The TA proposes that an up front lump sum Spectrum Utilization Fee ("**SUF**") be payable by operators for the use of BWA spectrum. The TA considered this a more appropriate basis than a deferred payment approach as, under the latter approach, the operator would be required to submit a bond in order to guarantee the SUF payment and interest would have to be paid for the deferred payment. As a result, the administrative effort and cost associated with a deferred payment approach would be much greater than that compared with an up front lump sum payment approach.

80. In fact, most recently, the TA confirmed that he would be adopting an up front lump sum payment approach for SUF in respect of the new CDMA2000 licence which is expected to be issued later on this year[12].

81. In the Consultation Paper, OFTA asks:

Question (13): Do you have any further comments on the TA's preliminary view that an up-front lump sum payment basis should be adopted for SUF, the amount of which will be determined through an open auction ?

82. PCCW supports a simple approach to the payment of SUF and agrees that an up front lump sum payment approach should be adopted. This would avoid all the

[12] See paragraph 35 of the TA Statement on *Licensing of Spectrum in the 850 MHz Band to enable the Provision of CDMA2000 Service* issued on 27 April 2007 ("**CDMA2000 Statement**").

administrative work that would have be undertaken by the TA and the operator in subsequent years if a deferred payment approach were to be adopted.

Open Network Access

83. Under the terms of their licences, the existing 2G and 3G mobile operators are required to open up at least 30% of their network capacity to Mobile Virtual Network Operators or content providers.

84. Today, however, the TA no longer considers it necessary to impose such an "Open Network Access" ("**ONA**") requirement on new licensees as there are a large number of wireless platforms available and a high degree of competition in the market, such that market forces and economic principles should serve to ensure that the market is working properly without the need for intervention by the regulator. Indeed, this is the approach that has already been adopted by the TA under the

85. On this basis, the TA suggests that there is no need to impose an ex ante ONA requirement on BWA licensees. Only if there is a market failure will the TA consider stepping in to make a determination under Section 36A or a direction under Section 36B of the Telecommunications Ordinance.

86. Indeed, it is again relevant to note that the TA recently decided not to impose an ONA requirement on the new CDMA2000 licence which is to be issued later on this year[13].

87. In the Consultation Paper, OFTA asks:

Question (14): Do you agree that BWA licensees should not be subject to an ex ante ONA requirement ?

88. From the experience in recent years, it is clear in Hong Kong that the regulator is seeking to increasingly liberalize the telecommunications market and free existing operators and prospective licensees from unnecessary ex ante obligations. Today, all markets are fully competitive and no entity has market power. Recently, in April of this year, the TA, in setting out the terms and conditions to be attached to the forthcoming licences for CDMA2000 services, decided that such licensees should not be subject to any ONA requirement, contrary to the approach taken in previous years for 3G mobile licensees.

89. PCCW agrees with this approach. In a highly developed and fully competitive market such as Hong Kong, any form of ex ante regulation by the TA would be regarded as highly intrusive and damaging to the state of competition in the market absent a showing of market failure. On this basis, the TA is correct in not requiring prospective BWA licensees to be subject to any ONA obligation.

[13] See paragraph 50 of the CDMA2000 Statement.

90. This does, however, raise the question as to why the existing 2G and 3G mobile operators need to continue to be subject to an ONA requirement. Continuing to impose such an onerous obligation on the existing mobile operators places them at a distinct competitive disadvantage to other service providers offering competing substitute services. In today's developed market, there is no longer any reason to impose such an obligation. The market can provide sufficient resale capacity.

91. The imposition of the ONA requirement was originally intended to open up the market to Mobile Virtual Network Operators ("**MVNOs**") or content providers. Upon reflection, there does not seem to be any real demand for such operators. In addition, the market can supply any needed capacity.

92. On this basis, to be consistent with the recent approach adopted by the TA, PCCW would suggest that it is now timely to remove the ONA obligation imposed on the 2G and 3G mobile operators. This would be conducive to the establishment of a level playing field, and is necessary to ensure that 2G/ 3G mobile operators are able to compete on an equal basis with BWA service providers, particularly given the close relationship between 3G mobile and BWA services recognized by OFTA in paragraph 6 of the Consultation Paper.

Assignment of Telecommunications Numbers

93. As BWA services may be fixed or mobile in nature, the TA suggests that it would be appropriate for the Telecommunications Numbering Advisory Committee to review whether there is a need for a new number range to be established for converged fixed-mobile services such as BWA.

94. In the Consultation Paper, OFTA asks:

Question (15): Do you consider that FMC services should be allocated with new number ranges ?

95. Consumers in Hong Kong have become used to associating telephone numbers with calls made using a fixed line (telephone prefix "2" or "3") or a mobile handset (telephone prefix "6" or "9"). To make any unnecessary changes to this system would likely confuse customers for no advantage. As BWA services can be either fixed or mobile in nature, adopting the same telephone number ranges could be potentially problematic. Using the existing number blocks for fixed line and mobile services is also likely to accelerate exhaustion of the already depleting stocks of these number ranges. PCCW therefore proposes that a distinct number range be adopted for FMC services, such as BWA, to make it easier for consumers to recognize calls made by parties using these new services.

96. In the event that no new number range is established for FMC services, the TA proposes that, in line with existing practice, the following number ranges should be adopted for BWA services:

- Prefix "2" or "3" used for BWA services which are fixed in nature or have limited mobility; and

- Prefix "6" or "9" used for BWA services which are fully mobile.

97. In the Consultation Paper, OFTA asks:

Question (16): Do you agree that numbers with prefixes "2" and "3" should be allocated to fixed/ "limited mobility" BWA services while numbers with prefixes "6" and "9" should be allocated to "full mobility" BWA services ?

98. At the outset, PCCW still considers it best, if at all possible, to use a distinct number range for BWA services as there may be cases where it is difficult to classify the service as either a "limited mobility" or "full mobility" service, e.g. a BWA service which enables the customer to make calls as if from a fixed line at home but, at other times, can be used as a fully mobile service.

99. If, however, no new number ranges are available, then the approach proposed by the TA must be adopted in order to at least provide some indication to the call recipient as to the nature of the call. In this instance, perhaps it would be clearer to redefine the use of the number prefixes as follows:

- Number prefix "6" and "9" allocated to BWA services which are capable of being used to provide full mobility. Thus, even if the customer chooses to use the service in the same manner as a traditional fixed line service, he/ she will be assigned a telephone number with prefix "6" or "9".

- Number prefix "2" and "3" allocated to all other BWA services, i.e. those services which are not capable of providing full mobility.

Number Portability

100. At present, Fixed Carrier/ Fixed Telecommunications Network Services licensees are required to facilitate Operator Number Portability ("**ONP**") to enable the porting of numbers between fixed line operators, and Mobile Number Portability ("**MNP**") to facilitate the porting of numbers between mobile operators. Mobile carrier licensees, on the other hand, are required to facilitate MNP.

101. The TA considers that BWA licensees should be required to support number porting to/ from *both* fixed line and mobile operators since BWA services could be either fixed or mobile in nature.

102. In addition, depending on the results of the market research to be conducted by OFTA regarding the consumer demand for porting numbers between fixed line and mobile networks, i.e. Fixed-Mobile Number Portability ("**FMNP**"), BWA licensees may also be required to facilitate FMNP.

103. In the Consultation Paper, OFTA asks:

Question (17): Do you agree that BWA licensees should be subject to the requirement of facilitating both ONP and MNP, including the FMNP to be introduced in the future ?

104. In keeping with a true market-driven approach, PCCW considers that there is no need to impose a requirement on BWA licensees to offer any form of number porting. The market should be able to decide for itself whether this needs to be an attribute of the BWA services available. If consumers find that they require number portability, they will naturally only subscribe to those BWA service providers that offer this feature, and BWA licensees will then be compelled to provide number portability, be it ONP, MNP or FMNP.

Denial of Service to Suspected Stolen Apparatus

105. To combat the use of stolen handsets, the TA is considering imposing a requirement on BWA licensees to deny service to any person who possesses or uses a mobile handset which is stolen or suspected of being stolen.

106. OFTA has advised that this requirement has already been incorporated into the existing mobile carrier licences.

107. In the Consultation Paper, OFTA asks:

Question (18): Do you agree that BWA licensees should be subject to the requirement of denial of service to suspected stolen apparatus ?

108. In the interests of combating theft, PCCW concurs that BWA licensees should be required to institute processes to ensure that service is denied to any persons possessing or using a mobile handset that is stolen or suspected of being stolen.

TECHNICAL ISSUES

109. In this section of the Consultation Paper, OFTA deals with certain technical matters regarding the use of block edge emission masks and guard bands in the designated spectrum range in order to avoid interference with services in adjacent frequency channels.

Block Edge Emission mask in 2.3 GHz Band

110. In order to resolve mutual interference between two radio systems operated by different operators in adjacent frequency blocks, block edge emission masks can be specified to establish clear boundaries between the two operators by restricting the power density level for "out-of-block" emissions.

111. Rather than imposing such a per se requirement, however, the TA suggests it preferable for operators to firstly attempt to sort out any channel interference issues amongst themselves, and only if the matter cannot be resolved through coordination amongst the operators should compliance with block edge emission masks be imposed. The emission masks would be developed by the TA in consultation with the BWA licensees.

112. In the Consultation Paper, OFTA asks:

Question (19): Do you agree with the proposed approach as stated in paragraph 58 to resolve adjacent channel interference issues ?

113. PCCW generally concurs with the TA's proposal that operators should attempt to sort out any channel interference issues amongst themselves before asking the TA for assistance. This would be consistent with a light-handed regulatory approach.

114. Nevertheless, to make this process easier, it would be helpful if the TA could provide some initial guidance as to the appropriate block edge emission masks to be adopted by the operators. This could then be used by the operators as a point of reference when procuring equipment and should hence minimize the likelihood of interference occurring. Joint OFTA/ industry testing may be useful here.

Guard Bands and Available Bandwidth for BWA Service in 2.3 GHz Band

115. As the frequency bands immediately above and below the 2.3 GHz range are already occupied by other services[14], the TA proposes to separate BWA services from these services by using the following guard bands:

[14] The 2.20 – 2.29 GHz band is occupied by Electronic News Gathering ("**ENG**")/ Outside Broadcast ("**OB**") links and the 2.400 – 2.4835 GHz is a licence exempt band currently being used for indoor wireless Local Area Networks and WiFi hotspots.

- 2.290 – 2.305 GHz (total of 15 MHz); and
- 2.390 – 2.400 GHz (total of 10 MHz).

116. Doing so, however, renders these frequency blocks at the upper and lower edge of the 2.3 GHz band unusable, such that only a total bandwidth of 85 MHz remains available for offering BWA services in the 2.3 GHz range.

117. The TA suggests that it is possible to reduce the size of the guard band at the lower edge of the 2.3 GHz band by 5 MHz (thereby making the 2.300 – 2.305 GHz available for BWA services) if the BWA service provider occupying this frequency block undertakes not to cause any harmful interference to the ENG/ OB link users below 2.29 GHz and the BWA service provider also takes the necessary technical measures to protect itself from possible interference caused by the ENG/ OB links.

118. In the Consultation Paper, OFTA asks:

Question (20): ***Do you agree with the proposed guard bands for the 2.3 GHz band ?***

Do you agree with the arrangement for the spectrum holder at the lower edge of 2.3 GHz band to use the spectrum 2.300-2.305 GHz as stated in paragraph 60 ?

119. It would be unfair to the operator who is allocated spectrum at the lower edge of the 2.3 GHz band to have to make special arrangements or use special equipment to ensure that no interference is caused to ENG/ OB link users. In fact, as the Hong Kong market is small, equipment manufacturers are unlikely to be unwilling to customize products for the Hong Kong market.

120. If, therefore, the TA considers that reducing the guard band to 10 MHz at the lower edge of the spectrum band still carries a risk of interference with ENG/ OB links, he should consider retaining the full 15 MHz as guard band per his initial proposal.

CONCLUSION

121. PCCW would strongly suggest that the 2.3 GHz and 2.5 GHz spectrum bands be auctioned in one single comprehensive exercise. This would maximize the ability of investors to make cogent business decisions and ultimately permit the most efficient roll out of new services. Such an approach should not delay the ultimate delivery of BWA services to users.

122. In general, PCCW agrees with the proposals put forward by the TA in the Consultation Paper and considers that, as far as possible, a "let the market decide" approach should be consistently applied to all aspects of the licensing and granting of spectrum for BWA services. Such an approach would be in keeping with the market-driven policy which the TA has been advocating and seeking to implement in recent years.

Submitted by
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